



Technical Manual

GC GRADIA

Total Aesthetic Harmony



New concept
Light curable micro-ceramic-composite
for Crown & Bridge, Inlays and Veneers
with unsurpassed durability, natural
opalescence and excellent lifelike aesthetics.

GC

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INTRODUCTION



Light-cured composites for dental restorations have become popular thanks to their excellent physical properties and ease of use. With growing demands for higher aesthetics in dental treatments, also superior quality has become a crucial requirement. This implies a higher availability of composites of superior aesthetics and quality, next to ceramics.

Dentists and Dental Technicians likewise were seeking a durable dental composite that rivaled the aesthetics of porcelain: however so far, composite fillers affected the translucency and opalescence of C&B composite systems. With this as background, GC GRADIA has been developed with all these requirements in mind.

New GC GRADIA resulted in a high-strength micro-hybrid composite system with the brightness, translucency and warmth in the oral environment likewise porcelain, useful for inlays, veneers and crowns.

The aesthetic potential of this composite has been thoroughly reviewed. Instead of the pale colour that is typical for traditional C&B composites, GC GRADIA features a bright and warm colour that makes it similar to the best ceramic now available. Once in the mouth, GC GRADIA has an appearance that closely resembles the natural tooth, which was not feasible with traditional composites.

GC GRADIA features a high mechanical strength, thanks to its hybrid MFR formulation of polymer that has reinforced bonding between the organic-inorganic filler and the lightly filled matrix resin. GC GRADIA shows excellent physical properties such as surface smoothness (typical of MFR composites) and wear-resistance. It is bio-compatible and kind to opposing dentition. In addition to the lifelike tooth shades GC GRADIA offers easy to apply opaque materials with excellent flow and cure properties. The tin, even layers of FOUNDATION OPAQUE and OPAQUE shades mask color effectively and are easily and quickly light cured. All shades of GC GRADIA polymerize completely with short irradiation times using the GC STEPLIGHT SL-I during layering and characterization followed by the GC LABOLIGHT LV-III for final curing. Polymerization results in no change to GC GRADIA's colour allowing technicians to see subtle colours of the final restoration throughout all phases of fabrication.

GC GRADIA introduces a new standard for dental composites with better aesthetics and a wider range of clinical applications. We believe GC GRADIA will meet the needs of dentists and laboratory technicians as a restorative material for both anterior and posterior applications in the mouths of the most aesthetically demanding patients.



1. GC GRADIA COMPONENTS



■ **FOUNDATION OPAQUE (FO): 1 shade**

A paste-type opaque with exceptional light-curing characteristics. Flows readily into small areas. Polymerizes even in undercut areas of framework and has a bright light yellow color, as an ideal base for additional opaque applications.

■ **OPAQUE (O): 16 shades**

A paste-type opaque that applies readily, flows easily yet will not drip or run. Exceptional masking properties. The 16 shades express all of the basic tooth shades.

■ **MARGIN OPAQUE (MO): 1 shade**

Usually applied after the FOUNDATION OPAQUE in widths of 1 mm around the cervical margin. Effective in masking unwanted alloy show through around the margin. Can also be used on molar occlusal and lingual surfaces of jacket crowns. Easy to apply and fluid without running. It can be used in combination with OPAQUE to modify the standard colour.



■ **OPAQUS DENTIN (OD): 22 shades: 16 based on Vita ® shades and 6 shades of OPAQUS DENTIN INTENSIVE**

When thick layers of composite can not be applied, OPAQUS DENTIN (opaque dentin) can be used instead of the regular DENTIN to reduce the white shade of OPAQUE and express a deeper colour. OPAQUS DENTIN can also be used as a cervical colour (choosing one shade darker than the crown's, for instance ODA3.5 for an A3) in order to achieve deeper shades in the cervical and root areas.

■ **SHOULDER DENTIN (SD): 6 shades**

Used, among other things, to make custom shades. SHOULDER DENTIN creates deeper, richer cervical and root colours and reproduces the reflective brightness of natural teeth. In addition, can be used to mask the underlying alloy.

■ **DENTIN (D): 16 shades**

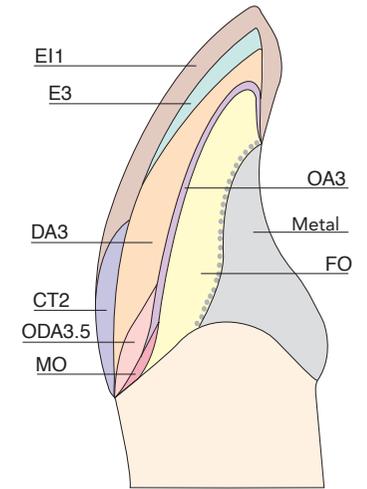
Has exceptional elongation properties and strength. These features permit forming it into delicate, long, finger-like strands or other like shapes. Masking ability is superb and exhibits a brighter colour which can reflect through a larger amount of Enamel. Superior to conventional dentin materials.

■ **INTENSIVE COLOR (IC): 15 shades**

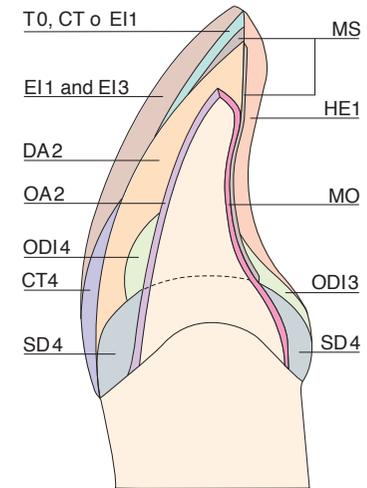
This group consists of 14 colours, frequently used in porcelain, and one Clear (IC0), which can also be used to subdue the colour intensity of the 14 shades. The stains can be used after applying OPAQUE, DENTIN and ENAMEL. Where incisal is backed by alloy and lacking clarity, applying (IC7) Lavender creates an appearance of translucency.

■ **ENAMEL (E): 4 basic shades**

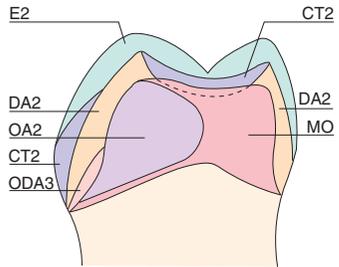
Enamel shades eliminate a too strong opalescence and the pale, whitish look of conventional materials. These exhibit warmth and true translucency.



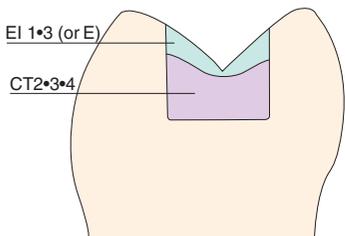
Veneer (incisal-free metal casting)



Jacket crown



Jacket crown / Full coverage resin crown



Inlay

■ **HALO ENAMEL (HE): 1 shade**

Frames and contours the tooth when applied at the incisal edge, the proximal surfaces or the occlusal of posterior teeth. Comes in easy-to-apply, delicate yellow colored paste.

■ **PEARL ENAMEL (PE): 2 shades**

White pastes used at cusp tips to create decalcification spots and other white blemishes found in natural teeth.

■ **ENAMEL INTENSIVE (EI): 3 shades**

Highly translucent. In a multi layering application, deep colour and depth can be obtained by using in the same manner as a conventional Enamel. In particular, it can be used for the occlusal surfaces of posterior teeth.

■ **TRANSLUCENT (T): 5 shades**

Five different degrees of translucent matching subtleties found in natural teeth.

■ **CERVICAL TRANSLUCENT (CT): 3 shades**

Highly translucent with a light amber colour. Can be applied cervically or in the incisal area to obtain deeper translucency. It is also used as dentin for inlays and posterior crowns, providing the resin with an aesthetic finish while maintaining the tooth colour.

■ **MAMELON STAIN (MS): 3 shades**

Used to create mamelon striations and other effects found in natural teeth.

■ **GC GRADIA DIE HARDNER**

Die Hardner, when coated on dies, hardens and preserves the surface during fabrication of inlays, jacket crowns, etc.

■ **GC GRADIA SEPARATOR**

A composite resin separator that is applied to working stone models when making inlays and onlays. It functions optimal on a Die Hardner treated stone surface.

■ **GC GRADIA DIAPOLISHER**

Developed specifically for the GC GRADIA System, this fine diamond-containing material is used on a felt wheel to apply a lustrous finish to restorations.

■ **GC GRADIA AIR BARRIER**

This agent creates an air barrier to guarantee a complete polymerization of the composite surface and avoid the inhibition layer.

■ **GC COMPOSITE PRIMER**

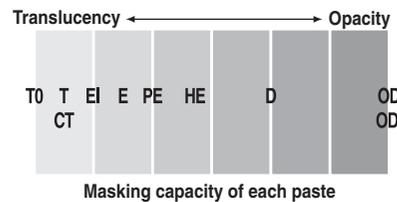
It is a light-curing bonding agent used for the additional application of composite layers and for repair works. GC COMPOSITE PRIMER can also be used as a modeling liquid to lubricate the spatula when applying the resin pastes.

■ **GC METALPRIMER II**

A tenacious bonding agent between the first composite layer e.g. FOUNDATION OPAQUE and the metal framework.



2. SHADE COMBINATION CHART



GRADIA CHARACTERIZATION

SHOULDER DENTIN	SD2	SD1	SD4	SD5	SD7	SD1									
OPAQUE DENTIN INTENSIVE	OD01	OD2	OD3	OD4	OD5	OD6									
ENAMEL INTENSIVE	E0	E1	E3	E5											
HALO ENAMEL	HE1														
PEARL ENAMEL	PE1	PE3													
TRANSLUCENT	T2	T1	T2	T4	T5										
CERVICAL TRANSLUCENT	CT2	CT3	CT4												
MAMELON STAIN	MS2	MS3	MS5												
INTENSIVE COLOR	IC2	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13	IC14
FLOWABLE COMPOSITE	F-WT	F-WS	F-T3												

IRRADIATION TIME CHART

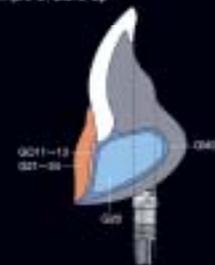
	LAB LIGHT LEVEL 2		STAYSHT SL1
	Pre-cure	Final Cure	Pre-cure
FOUNDATION OPAQUE OPAQUE MARGIN OPAQUE GUM OPAQUE GUM OPAQUE MODIFIER	1 min.	—	—
DENTIN OPAQUE DENTIN OPAQUE DENTIN INTENSIVE SHOULDER DENTIN ENAMEL ENAMEL INTENSIVE HALO ENAMEL PEARL ENAMEL TRANSLUCENT CERVICAL TRANSLUCENT GUM GUM MODIFIER GUM TRANSLUCENT	30 sec.	3 min.	10sec.*
INTENSIVE COLOR MAMELON STAIN FLOWABLE COMPOSITE	30 sec.	—	10sec.*

*For one surface of a single crown

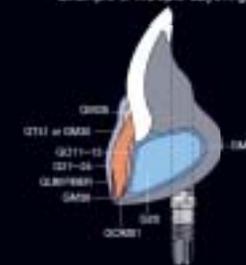
GRADIA GUM SHADE COMBINATION CHART

OPAQUE	GUM OPAQUE	GO11	GO12	GO13	GUM FIBER GF71			
	GUM OPAQUE MODIFIER	GO051						
BODY (Pastel)	GUM	G20	G21	G22	G23	G24		
MODIFIER (Gel)	GUM MODIFIER	GM00	GM01	GM02	GM03	GM04	GM05	GM06
TRANSLUCENT (Gel)	GUM TRANSLUCENT	GT41						

Example of Build-up



Example of Multiple-Layering Technique



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3. GC GRADIA CHARACTERISTICS



1. NATURAL AESTHETICS

1) GC GRADIA colour tones and translucency similar to those of natural teeth

Its level of brightness and light transmission is similar or closer to porcelain than conventional composites. Where required, the underlying tooth preparation can be masked while maintaining a natural, life-like appearing anterior jacket crown. Thus the GC GRADIA's build-up technique mirrors those used for ceramics.

2) Reduction of pale opalescence typical for composites

The opalescence and fluorescence features typical for composites could not be avoided so far, especially with translucent colours. When a crown was seated under the light conditions found in the mouth, the excessively opalescent colour would make it impossible to reproduce the natural colour. These features have been changed in GC GRADIA by optimizing the filler particle size, thereby controlling and adjusting the diffusion of light through the material. This allows to maintain the desired colour, created at dentin level, also when the restoration is seated in the mouth.

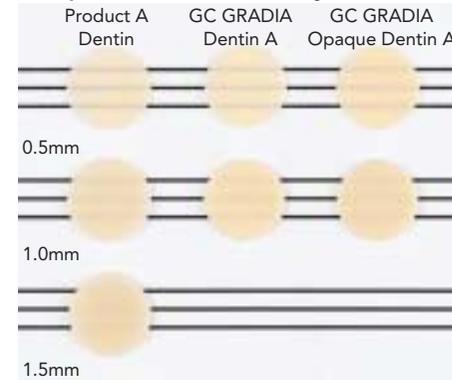
3) GC GRADIA's complete spectrum of colours

GC GRADIA has a complete spectrum of colours comparable to natural dentition offering wider range than other composite systems.

1. OPAQUS DENTIN (OD) is used to express the deep cervical colours. SHOULDER DENTIN (SD) follows the same concept as shoulder ceramic bodies.
2. MAMELON STAIN (MS) allows to easily reproduce the dentin structure in the mamelon area. INTENSIVE COLOR (IC) is available in 15 shades and is effective in characterizing crowns with cracks, decalcification areas, etc.
3. ENAMEL INTENSIVE (EI) shades create the appearance of depth. CERVICAL TRANSLUCENT (CT) has a translucent amber color that is particularly suitable for the cervical area.
4. HALO ENAMEL (HE) is used to clearly express the contour of the tooth. PEARL ENAMEL (PE) is applied to express white lines/zones and cusp tips.

GC GRADIA's wide range of colours enables restorations to appear more like porcelain than other composites.

Comparison of translucency



11: Jacket crown made with conventional composite
21: GC GRADIA Jacket crown

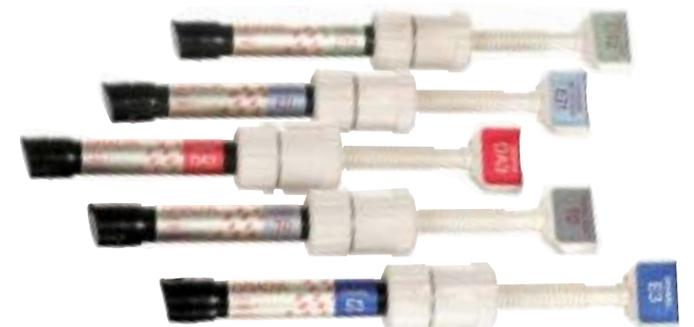
Comparison of opalescence



Comparison of fluorescence



A comparison of GC GRADIA's translucent colour tones with its competitors demonstrates that colours and translucency are similar. However, a comparison of fluorescence on a black background – as in the mouth – shows that GC GRADIA features a more natural fluorescence compared with other products.

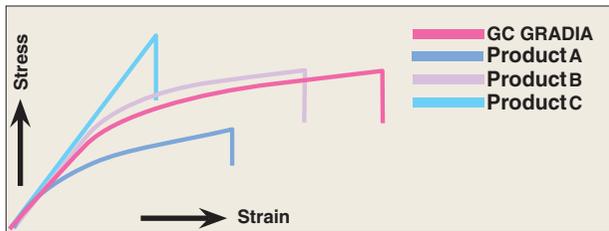


2. HIGH MECHANICAL STRENGTH FOR USE IN A WIDE RANGE OF CASES

GC GRADIA provides superior physical properties and beautiful, natural aesthetics. The unique chemistry of GC GRADIA couples its micro-fine ceramic/pre-polymer filler with urethane dimethacrylate matrix to produce a unique ceramic composite with exceptionally high strength and wear resistance.

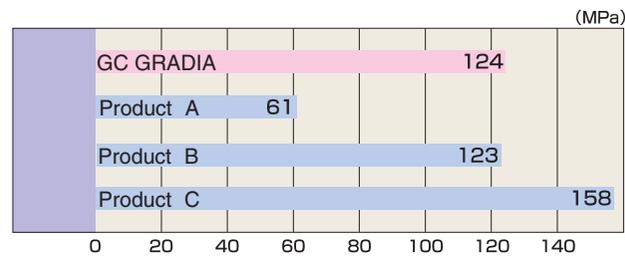
As a consequence, GC GRADIA can be safely used also in those cases in posterior areas where often chipping and cracking problems occur.

■ Stress-strain curve (fracture resistance)

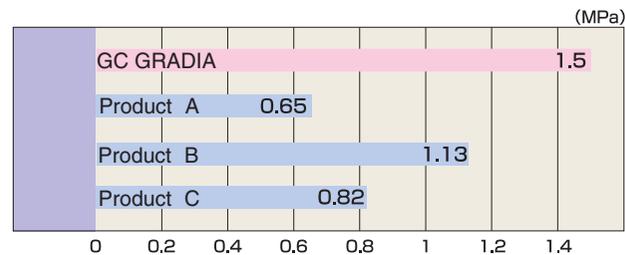


Product A = MFR conventional composite
 Product B = Last-generation composite for restorations
 Product C = Hybrid ceramic

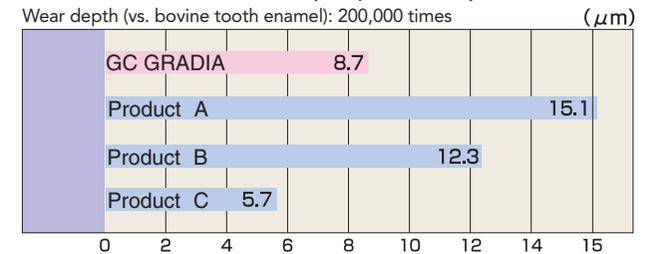
■ Flexural strength



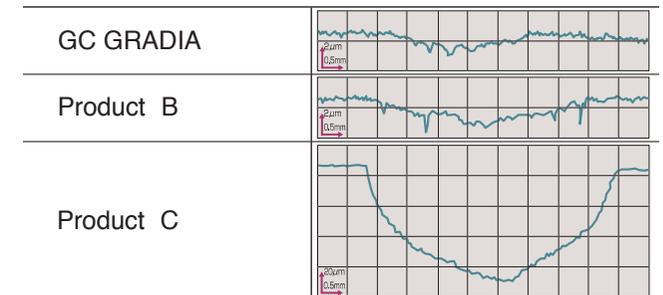
■ Flexural energy



■ Occlusal wear – Horizontal slide with a load of 1.7 MPa on bovine enamel (200,000 times)



■ Wear depth of bovine tooth enamel (surface roughness)





3. EXCELLENT HANDLING CHARACTERISTICS

1) Ease of application

FOUNDATION OPAQUE flows readily into undercut areas made from 100 µm RETENTION BEADS II SSS. The thixotropic properties of OPAQUE allow a uniform application without pooling. The texture of DENTIN ENAMEL pastes permits easily controlled spreading on all surfaces, also on complex surfaces such as occlusals of inlays and posterior crowns.



3) Easy polishing

GC GRADIA's durable micro-ceramic composite surface is easily brought to a lustrous gloss with the GC GRADIA DIAPOLISHER.



2) Simple Light pre-curing

By using the new GC STEPLIGHT SL-I pre-curing light unit, the precuring time of GC GRADIA pastes (excluding opaque materials) is reduced to 10 sec.



4) Easy Intra-Oral Repairs

Using GC COMPOSITE PRIMER and a conventional operatory curing light makes intra-oral repairs quick and easy.



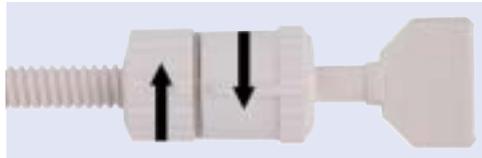
4. NEW ENVIRONMENTALLY FRIENDLY SYRINGE

The screw section of the syringe can be re-used by simply replacing the barrel that contains paste, thus eliminating waste.

1) Remove the used syringe barrel.



2) Rotate hub to unlock.



3) Remove plunger.



4) Attach new syringe barrel to hub, insert plunger and lock hub.



4. CLINICAL PROCEDURE



ORAL EXAMINATION

Determine whether GC GRADIA is suitable for the patient.

- Indications:**
1. Anterior and posterior jacket crowns. Full coverage crowns.
 2. Anterior veneer metal-backed crowns, with or without incisal support.
 3. Inlays, onlays, laminate veneers.
 4. Implant superstructures.

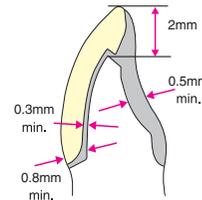
Contra indications: Malocclusions, bruxism or clenching.

ABUTMENT TOOTH AND CAVITY PREPARATIONS

Tooth preparation and design of restorations vary according to circumstances. The instructions for a correct preparation are illustrated below.

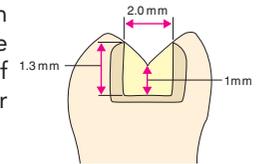
■ Anterior veneer crown (With Incisal Support)

The preparation is similar to a PFM crown. The margins should have a deep chamfer or shoulder with minimum depth of 0.8mm. Thickness of metal framework on the labial side should be 0.3mm.



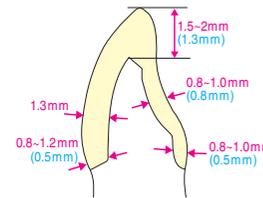
■ Inlay

Contour the cavity with rounded internal line angles. Avoid contact of opposing occlusion with the margins of restoration. The pit & fissure minimum depth should be 1.0mm, the width of occlusal surface at least 2.0mm with only shoulder margins occlusally. Interproximally, it should be box shaped.



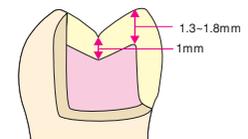
■ Anterior jacket crown

Prepare abutment tooth similar to a PFM crown (minimum of 1.3mm labial). Margin-design can be a deeper chamfer or shoulder (0.8mm).



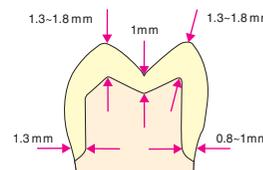
■ Onlay

Contour the cavity with rounded internal line angles. Avoid contact of opposing occlusion with the margins of the restoration. Pit & fissure depth minimum should be 1.0mm and cusp at least 1.3mm.



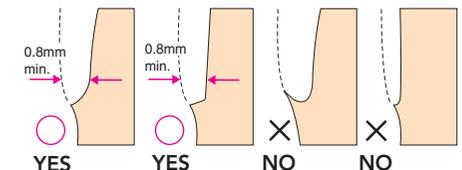
■ Posterior jacket crown

The occlusal reduction should be at least 1.3mm. Margins should have 1.3mm depth with a deep chamfer or shoulder.



■ Margin preparations

Prepare deep chamfers (1) or shoulders (2).



IMPRESSION TAKING

Retract gingiva in normal manner. Use a vinyl silicone impression material such as GC EXAMIX NDS, GC EXAFAST NDS, GC EXAJET or GC EXAFLEX.



EXABITE II NDS

BITE REGISTRATION AND COLOUR RECORDING

Use GC EXABITE II to make occlusal or bite registration. Select a shade from the Vitapan® classical shade guide.



GC UNIFAST III

TEMPORARY RESTORATION

Fabricate temporary restoration with GC UNIFAST TRAD / GC UNIFAST LC or GC REVOTEK LC and cement with a eugenol-free temporary cement such as GC FREEGENOL.



GC EXAMIX NDS, GC EXAFAST NDS, GC EXAJET and GC EXAFLEX

POUR & PREPARE MASTER MODEL

Pour and prepare working model with a Type IV die stone such as GC FUJIROCK EP.



GC FUJIROCK EP



GC FREEGENOL

PRODUCTION OF THE RESTORATION Refer to COMPOSITE BUILD-UP PROCEDURE, pages 12 - 27

REMOVAL OF THE TEMPORARY RESTORATION AND CLEANING

Remove temporary restoration, sealing material or cement. Clean cavity. Rinse and dry cavity thoroughly.

CLEANING AND TREATMENT OF THE RESTORATION FOR BONDING

■ Internal Metal bonding surface

Sandblast the metal surface with aluminum oxide (+/- 50 microns) and apply a thin layer of GC METALPRIMER II. After applying the primer, carefully avoid contaminating the metal surface before cementing the restoration.

Precaution: Apply one or two thin coats of GC METALPRIMER II. A too thick coat can reduce adhesive strength.

■ GC GRADIA internal bonding surface (metal free restorations)

Apply thin layer of GC COMPOSITE PRIMER to internal bonding surface then light cure with conventional operatory curing light for 20 sec. When using LABOLIGHT LV-II/LV-III, light-cure for one minute.

Cement with GC FUJI PLUS or comparable dental cement per manufacturer's instructions.

Adjust occlusal surface with diamond or carborundum point then use silicone points. Finally, add GC GRADIA DIAPOLISHER to felt or chamois wheel and buff to a lustrous finish.

CEMENTATION

ADJUSTING & POLISHING OCCLUSAL SURFACE



GC METALPRIMER II



GC COMPOSITE PRIMER



GC LABOLIGHT LV-II / LV-III



GC FUJI PLUS

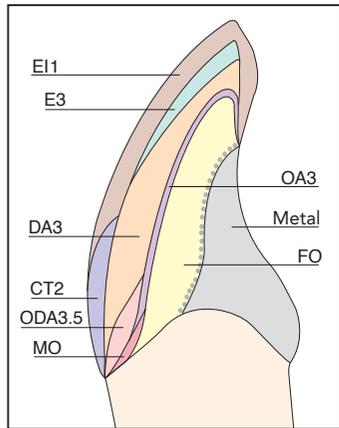


GC GRADIA DIAPOLISHER



5. COMPOSITE BUILD-UP PROCEDURE

1. ANTERIOR VENEER CROWN (INCISAL FREE METAL BACKING)



1. PREPARING MASTER MODEL



Prepare the master model in the usual manner using GC Fujirock EP. Margins pencilled in red.

2. WAX-UP



Apply GC Multisept to the master die. Use different coloured wax in order to easily identify the thickness of wax during veneer cut-out. Fully contour the wax-up.

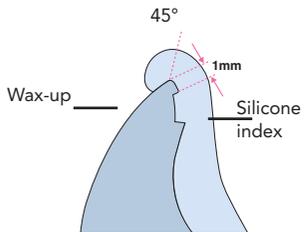


Underlying wax colour acts as a depth guide.



Scribe 1 mm from incisal and proximal areas, establishing where metal casting limits will be. Using a wax bur or instrument, remove 1 mm depth of wax incisal/lingual.

3. PREPARE SILICONE INDEX



Make lingual silicone impression index.



Use GC Exaflex Putty for making a silicon impression index.



Remove excess of silicon incisally to an angle of 45°. This silicon index is later used in building up Dentin and Enamel.

4. MAKING CASTINGS



Wax up die with GC Inlay Wax.



Retention Beads II SSS (particle size: 100µ) enhance mechanical bond strength between casting and GC GRADIA composite veneer. Used in combination with GC Metalprimer II bonding agent.



Apply a thin layer of Adhesive II for GC Retention Beads II SSS. Let surface dry and become tacky.



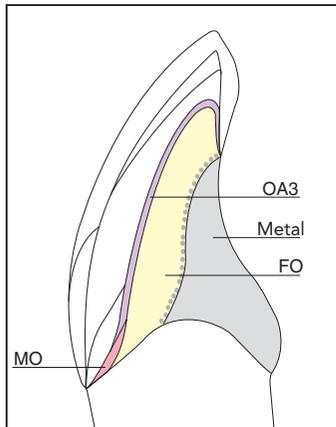
Sprinkle a layer of GC Retention Sprue and invest using a GC Beads II SSS evenly over wax phosphate bonded investment and surface.



cast in a normal way.

Chart 1 – Curing time for Opaque pastes

GC LABOLIGHT LV-II, III	1 minute
GC LABOLIGHT LV-I	3 minutes



5. PREPARE CASTING



Remove beads within 0,5 mm from margin area with a carbide bur.



Finish and polish metal casting in a usual manner.



Sandblast metal surface that requires application of GC METALPRIMER II with clean 50µ aluminium oxide.



Blow surface with clean, dry air and immediately apply GC METALPRIMER II. Note: There will be no change in surface look after coating.



GC METALPRIMER II is a metal adhesive thiophosphoric metacrylate (MEPS). Note: GC METALPRIMER II is very volatile. Replace bottle cap immediately after use.

6. FOUNDATION OPAQUE (FO)



Apply GC METALPRIMER II, one or twice by using a clean brush. Allow drying for a few seconds. Immediately start to apply FOUNDATION OPAQUE to avoid contamination of the bonding surface.



FOUNDATION OPAQUE shade serves as foundation of all shades. Dispense FOUNDATION OPAQUE into disposable pallet and shield with light protective cover.

Note: Remove any Opaque remaining on nozzle syringe tip with tissue paper.



Apply layer of FOUNDATION OPAQUE about 100µ thickness with flat brush. Note: If Opaque gets too thick, stir with brush to restore fluidity.



For best results, light cure Opaques with GC LABOLIGHT LV-III: see chart 1 above. Refer to curing depth of Opaque chart on page 28.

7. MARGIN OPAQUE (MO)



For deeper, richer cervical colours, apply MARGIN OPAQUE in 1 mm width cervically using a round brush.

8. OPAQUE (O)



To entire surface, apply two thin coats of OPAQUE (O) using a flat brush. Avoid to use a too thick layer, the curing process might turn out to be insufficient.



First layer



Second layer

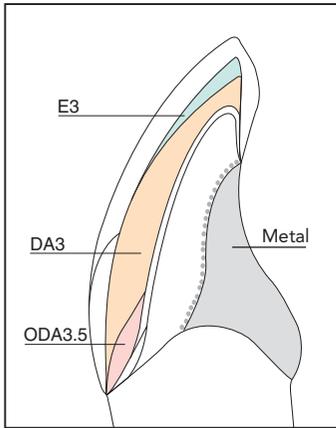
Light cure: chart 1

Light cure: chart 1

Light cure: chart 1

Chart 2 – Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds



9. OPAQUE DENTIN (OD)



For deeper, richer cervical, increase chroma by selecting next most saturated shade i.e., ODA3,5 for an A3. Apply OPAQUS DENTIN (OD) in 2-3 mm widths widths in cervical area.



Light cure: see chart 2



Note: To reproduce an individual colour for the cervical area following the individual patient case, SHOULDER DENTIN (SD) can also be used. SHOULDER DENTIN is available in 6 shades.

10. DENTIN (D)



Attach silicone index lingually. Apply Dentin paste leaving room for ENAMEL.



Note: To prevent voids, smooth DENTIN surface with flat brush.



Create mamelons 1,5 mm from incisal edge. Note: Apply MAMELON STAIN to accentuate striations.



Note: To increase appearance of translucency, apply INTENSIVE COLOR (IC7 Lavender).

Light cure: see chart 2

Light cure: see chart 2

Light cure: see chart 2

11. ENAMEL (E)



Apply appropriate ENAMEL shade starting at 1 mm from incisal edge towards center of crown, with silicone index still in place.



Light cure: see chart 2



ENAMEL characterization completed.



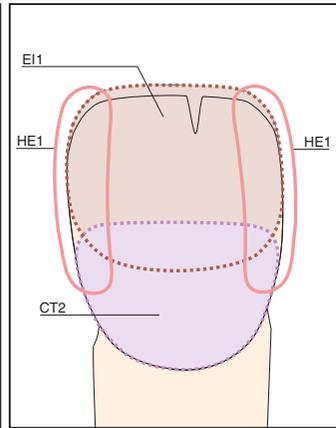
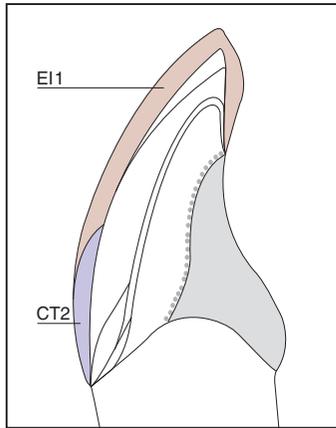
Side view of facial contour.

Chart 2 – Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

Chart 3 – Final curing time

GC LABOLIGHT LV-II, III	3 minutes
GC LABOLIGHT LV-I	5 minutes



12. CERVICAL TRANSLUCENT (CT)



For deeper, richer colour, apply (CT) at cervical area towards tooth center.

Light cure: see chart 2

13. ENAMEL INTENSIVE (EI)



Apply ENAMEL INTENSIVE at incisal edge towards cervical area for natural appearance.

Light cure: see chart 2

14. HALO ENAMEL (HE)



Add HALO ENAMEL to proximal areas to accentuate tooth contour.

Light cure: see chart 2

15. FINAL BUILD-UP



Application is complete on labial surface.



Remove silicone index. Apply ENAMEL INTENSIVE (EI) on the lingual surface as needed.

Light cure: see chart 2

16. AIR BARRIER



Immediately coat surface with GC GRADIA AIR BARRIER, light cure. Remove eliminate air inhibition layer and to ensure complete polymerization.

17. FINAL LIGHT CURING



After applying GC GRADIA AIR BARRIER, light cure. Remove eliminate air inhibition layer and to ensure complete polymerization.

Light cure: see chart 3

18. ADJUST CONTOUR



Adjust contour with diamond and/or carbide burs. Refer to page 16 for additional composite applications.



Note: To add resin, first roughen resin surface with bur, coat with GC COMPOSITE PRIMER and light cure 1 min. in GC LABOLIGHT LV-III.



Apply added material, DENTIN, ENAMEL or ENAMEL INTENSIVE and light cure 3 min. Then characterize surface with diamond and carborundum points.



Adjust surface Refine surface texture with diamond or carborundum points. Smooth with silicone points.



Finish Finish surface with Robinson Brush together with GC GRADIA DIAPOLISHER.



Polish & Buff Use GC GRADIA DIAPOLISHER on felt or chamois wheel for a lustrous finish.

Chart 2 – Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

Chart 3 – Final curing time

GC LABOLIGHT LV-II, II	3 minutes
GC LABOLIGHT LV-I	5 minutes

19. COMPLETED VENEER CROWN



Labial view



Lingual view



SHADE A3 AND GC GRADIA CROWN

GC GRADIA's brighter, deeper and richer colours provide superior aesthetics and vitality versus conventional composites.

ADDITIONAL BUILD-UP & REPAIRS



Roughen composite surface with bur.



Coat surface with a thin layer of GC COMPOSITE PRIMER.



Light cure 1 min. with GC LABOLIGHT LV-III or 20 sec. with conventional operator curing light.

Light cure: see chart 2



Apply desired additional shades.



Note: For extensive additions, cure with GC LABOLIGHT LV-III. If using conventional operator curing light, cure for 1 min.

Light cure: see chart 3

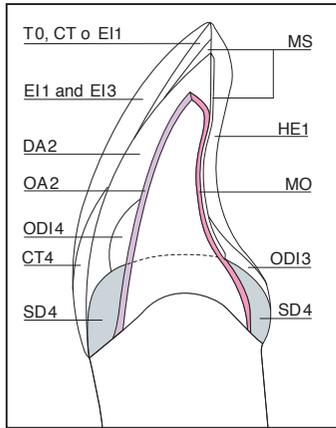


Refer to page 15 for finishing steps.

GC LABOLIGHT LV-II, II	1 minute
GC LABOLIGHT LV-I	3 minutes

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

2. COMPOSITE BUILD-UP PROCEDURE

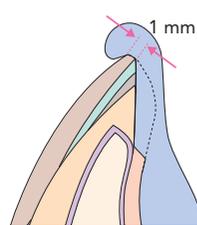


1. MODEL PREPARATION



Prepare GC Fujirock EP dies in normal manner. Pencil margins in red.

2. PREPARE SILICONE INDEX



Wax-up. Form silicone index lingually. Cut-off 1 mm from incisal. (Refer to page 12 – Prepare Silicone Index).

3. GC GRADIA DIE HARDNER



Coat dies with thin layer of Note: If needed, add wax as GC GRADIA DIE HARDNER. spacer.

4. GC GRADIA SEPARATOR



Apply thin coat of GC GRADIA SEPARATOR.

5: JACKET CROWN ON NATURAL DIE



Special pre-curing treatment for Jacket crown on a natural die, without discolouration. Apply thin coat of INTENSIVE COLOR (IC0 Clear).

6. JACKET CROWN ON ALLOY CORE



Light cure each surface for 10 sec. with GC STEPLIGHT SL-I. Proceed to # 7, SHOULDER DENTIN.

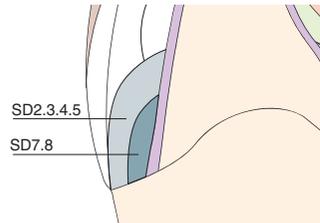
Special pre-curing treatment for Jacket crown on alloy core. Apply OPAQUE (O) to entire die surface. Than MARGIN OPAQUE (MO) to cervical and lingual surface.

Light cure: see chart 2

Light cure: see chart 1

Note: Followed step by step procedure illustrates the composite buildup process for a Jacket crown on alloy core.

7. SHOULDER DENTIN (SD)

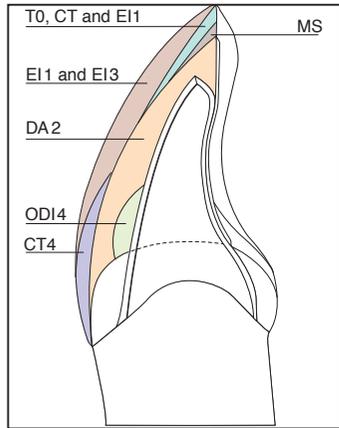


Apply SHOULDER DENTIN (SD2, 3, Note: Use SD7 or SD8 to mask For non-metal crown, use SD2, 3, 4 4 or 5) cervically. If SD is not available, underlying alloy then apply SD2, or 5 in cervical area. use DENTIN (increase chroma by 3, 4 or 5. selecting next most saturated shade, i.e.DA3,5 for an A3.

Light cure: see chart 2

Chart 2 – Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds



8. COLOUR MODIFICATION (INCISAL)



Place silicone index and apply dentin as a base. Apply INTENSIVE COLOR (IC7 Lavender) to the incisal area to increase translucency.

Light cure: see chart 2

9. COLOUR MODIFICATION (DENTIN)



To create natural variations of brightness in the dentin, apply OPAQUS DENTIN to cervical 1/3.

Light cure: see chart 2



Take care not to apply the OPAQUS DENTIN up to the final crown shape surface.

10. DENTIN BUILD-UP



Using silicone index, add DENTIN, leaving room for ENAMEL and characterizations and taken in consideration final shape of composite crown.

Light cure: see chart 2



11. MAMELON STAIN



Apply thin layer of MAMELON STAIN to create striation effects.

Light cure: see chart 2



Caution: Re-applying stains may create shadow under TRANSLUCENT layer.

12. ENAMEL / TRANSLUCENT



Apply ENAMEL or TRANSLUCENT shade, considering the final shape of the crown.

Light cure: see chart 2



Characterize incisal with MAMELON STAIN or by mixing INTENSIVE COLORS (IC3 & 4).

Light cure: see chart 2

13. TRANSLUCENT, HAIRLINE CRACKS

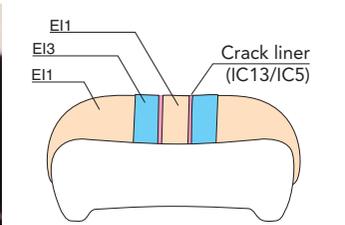


Apply appropriate CERVICAL TRANSLUCENT (CT) covering cervical 1/3 of crown. Add ENAMEL INTENSIVE (EI) and INTENSIVE COLOR (IC13 Crack liner) in vertical layering, then INTENSIVE COLOR.

Light cure: see chart 2



to create effect on hairline crack.



Cross section depicting creation of hairline crack effect.

14. COMPLETING LABIAL



Apply HALO ENAMEL (HE) to proximal areas to complete the labial build-up procedure.

Light cure: see chart 2

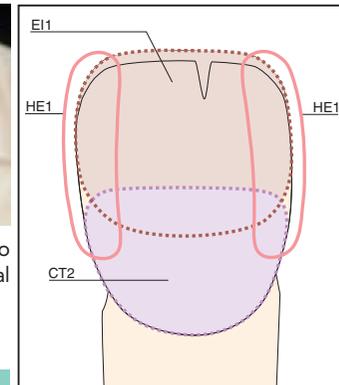
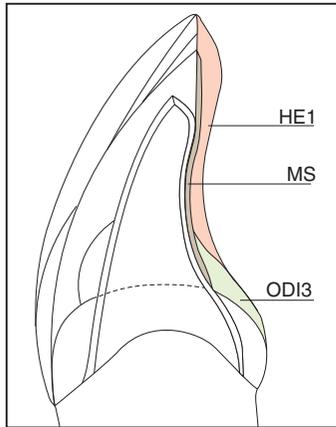


Chart 2 - Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

Chart 3 - Final curing time

GC LABOLIGHT LV-II, II	3 minutes
GC LABOLIGHT LV-I	35 minutes



15. COMPLETING LINGUAL



Apply appropriate MAMELON STAIN to prevent natural tooth from showing through resin surface.

Light cure: see chart 2



Apply OPAQUS DENTIN INTENSIVE to cervical 1/3.

Light cure: see chart 2



Progressively add HALO ENAMEL from incisal toward cervical.

Light cure: see chart 2

FINISH PROXIMALS



Add HALO ENAMEL to proximal areas. Slightly over contour proximals to allow grinding and polishing.

17. AIR BARRIER



Immediately coat surface with After applying GC GRADIA AIR BARRIER to BARRIER, light cure. Remove eliminate air inhibition layer GC GRADIA AIR BARRIER with and to guarantee complete water. polymerization.

Light cure: see chart 3

18. FINAL LIGHT CURE



19. REMOVE CROWN



20. ADJUST & POLISH



Adjust shape and contour surface. Polish by buffing. (see page 15)

21. COMPLETED CROWNS



Excellent fit and marginal integrity



Labial view



Lingual view



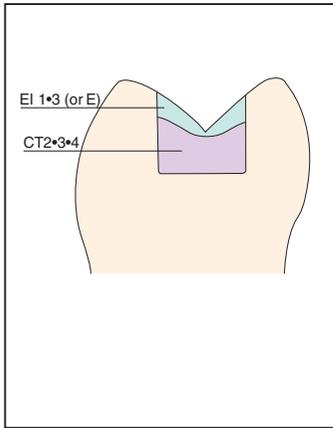
Chart 2 – Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

Chart 3 – Final curing time

GC LABOLIGHT LV-II, II	3 minutes
GC LABOLIGHT LV-I	3-5 minutes

3. COMPOSITE BUILD-UP PROCEDURE



1. MODEL PREPARATION



Pour model using GC FUJIROCK EP.

2. UNDERCUTS



Apply thin coat of GC GRADIA DIE HARDNER on die surface.



Block-out undercuts with wax.



Coat cavity with GC GRADIA SEPARATOR.

3. GRADIA SEPARATOR



Coat cavity with GC GRADIA SEPARATOR.

4. CERVICAL TRANSLUCENT (CT)



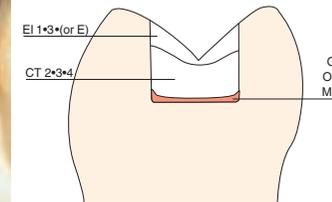
Apply thin layer of INTENSIVE COLOR (IC0 Clear).



Add CERVICAL TRANSLUCENT as dentin colour. Natural tooth colour will show through.



If tooth is discolored, first apply OPAQUE (O), MARGIN OPAQUE (MO) or OPAQUE DENTIN (OD) to cavity floor.



If tooth is discolored, first apply OPAQUE (O), MARGIN OPAQUE (MO) or OPAQUE DENTIN (OD) to cavity floor.

Light cure: see chart 2

Light cure: see chart 2

5. ENAMEL INTENSIVE



Apply appropriate ENAMEL INTENSIVE or ENAMEL and contour.

6. COMPLETED BUILD-UP



Light cure: see chart 2

7. AIR BARRIER



Immediately coat surface with Final light cure 3 minutes. Wash off GC GRADIA AIR BARRIER with water eliminate air inhibition layer (see page 15).



Light cure: see chart 3

8. CONTOUR & POLISH



Refine surface texture with diamond or carborundum points. Smooth with silicone points. Finish surface with Robinson Brush. Apply GC GRADIA DIAPOLISHER with felt or chamois wheel.



9. COMPLETED INLAY



Example of clinical cases

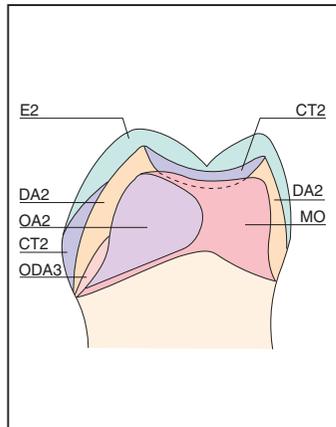
Chart 1 – Curing time for Opaque pastes

GC LABOLIGHT LV-II, II	1 minute
GC LABOLIGHT LV-I	3 minutes

Chart 2 - Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

4. POSTERIOR JACKET CROWN / FULL COVERAGE COMPOSITE CROWN



1. PREPARE MODEL



Pour model in GC FUJIROCK EP. Make cast coping in usual manner. Note: This step procedure is also suitable to a metal supported full coverage composite crown.

2. FOUNDATION OPAQUE (FO), OPAQUE (O), ETC.



Apply FOUNDATION OPAQUE then OPAQUE to facial. Add MARGIN OPAQUE to occlusal & lingual then OPAQUE DENTIN to cervical. After each application light cure.

Note: For jacket crowns, see steps 1-5 in 5-2 "ANTERIOR JACKET CROWNS", on page 17. If natural tooth is stained, start with OPAQUE.

Light cure OPAQUE: see chart 1

Light cure OPAQUE DENTIN: see chart 2

3. DENTIN (D)

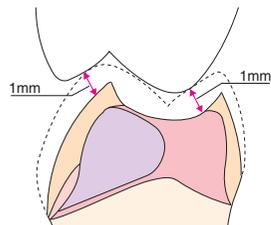


Apply DENTIN in usual manner.

Light cure: see chart 2



4. CHECK DENTIN HEIGHT



DENTIN build-up should have 1 mm freeway space. Note: Maintain 1 mm infra-occlusion, referring to adjacent and antagonist teeth.

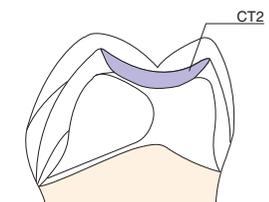


5. CERVICAL TRANSLUCENT (CT)



Add CERVICAL TRANSLUCENT to occlusal surface.

Light cure: see chart 2



6. CONFIRM FREEWAY SPACE



7. ENAMEL



Before light curing (CT), check to Check shape and position of ENAMEL. ensure there is adequate space for interproximal contacts. Apply ENAMEL while checking occlusal relationship.

Light cure: see chart 2

Chart 3 – Final curing time

GC LABOLIGHT LV-II, II	3 minutes
GC LABOLIGHT LV-I	3-5 minutes

8. AIR BARRIER

Coat surface with GC GRADIA AIR BARRIER and light cure. Wash off GC GRADIA AIR BARRIER with water.

Light cure: see chart 3

9. COMPLETED CROWN

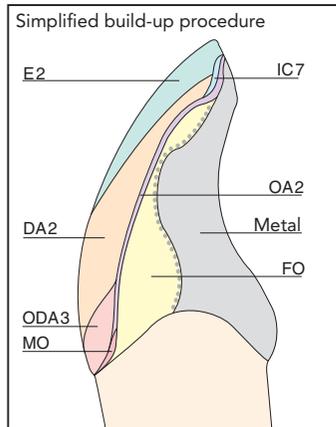


Completed crown after adjusting, contouring and polishing.



Clinical example of a GC GRADIA metal supported 3 unit bridge.

5. COMPOSITE BUILD-UP PROCEDURE



1. MODEL PREPARATION



Pour model using GC FUJIROCK EP. Prepare in normal manner.

2. FRAMEWORK



Coat die with GC MULTISEP, wax separator, wax-up crown and create veneer (window).

Note: Suggest making coping in different colour wax from build-up. Colour contrast will determine depth of veneer.



Cut out veneer or window, preserving proximal contact in metal.

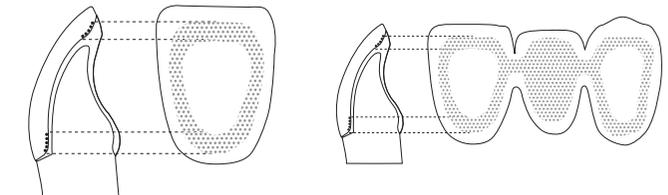


Apply thin layer of GC ADHESIVE II for GC Retention Beads II SSS. Allow to dry. Surface will get tacky.

Note: To get thinner coat cut tip of brush (See sketch of bead pattern to the right)



Sprinkle uniform layer of GC Retention Beads II SSS on surface. Note: Resin will bond to alloy with application of GC METALPRIMER II.



Bead coating design allows maximum room for shade reproduction and obtains a suitable mechanical retention strength.

CASTING



TRIM CASTING



Sprue then invest with GC's phosphate bonded within 0,5 mm of outer margins of investments. Cast and finish in normal manner.

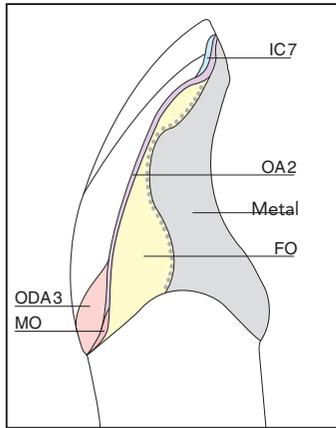
Remove any metal retention beads within casting.

Chart 2 - Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

Chart 1 - Curing time for Opaque pastes

GC LABOLIGHT LV-II, II	1 minute
GC LABOLIGHT LV-I	3 minutes



3. PREPARING METAL CASTING



Sandblast with clean 50µ aluminium oxide. Blow surface clean with clean-dry air and immediately prepare to apply GC METALPRIMER II.



Apply one or two thin coats of GC METALPRIMER II. Allow to dry. Surface will appear unchanged.

GC METALPRIMER II is very volatile. Replace bottle cap immediately after use.

As soon as surface is dry, immediately apply FOUNDATION OPAQUE to prevent surface contamination.

4. FOUNDATION OPAQUE (FO)

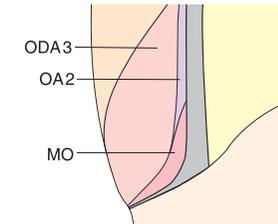


Apply FOUNDATION OPAQUE, a 100µm layer (thickness of RETENTION BEADS II SSS). Note: If OPAQUE gets a little thick, simply stir it with the brush to restore fluidity.

Opagues can ONLY be light cured with GC LABOLIGHT LV-II/LV-III. GC STEPLIGHT SL-I can not be used for opaque pastes.

Light cure: see chart 1

5. MARGIN OPAQUE (MO)



For deeper, richer cervical colour, apply MARGIN OPAQUE with round brush.

Note: MARGIN OPAQUE (MO) is applied onto FOUNDATION OPAQUE (FO). To avoid white line, do not apply (MO) over opaque.

Light cure: see chart 1

6. OPAQUE (O)



Apply two thin layers of OPAQUE using flat brush.

A too thick layer may not polymerize as well. Light cure first coat. Light cure second coat.

Light cure: see chart 1

Light cure: see chart 1

7. INTENSIVE COLOR (IC7)



To create translucency, add INTENSIVE COLOR (IC7) to incisal area. Use round brush.

Light cure: see chart 2

8. OPAQUE DENTIN (OD)



For deeper, richer cervical color, add OPAQUE DENTIN in 2-3 mm widths around the cervical area. Make (OD) one shade higher than the crown.

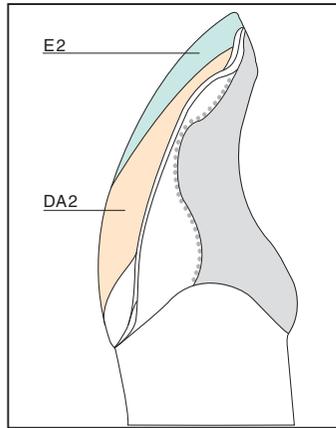
Light cure: see chart 2

Chart 2 - Curing time for Dentin/Enamel bodies and intensive colours

GC STEPLIGHT SL-I	10 seconds
GC LABOLIGHT LV-II, III	30 seconds
GC LABOLIGHT LV-I	60 seconds

Chart 3 - Final curing time

GC LABOLIGHT LV-II, II	3 minutes
GC LABOLIGHT LV-I	3-5 minutes



9. DENTIN



Build-up DENTIN to form and shape crown.
Leave room for ENAMEL.
Create mamelons from incisal to about center of crown.

Brush surface to prevent bubbles forming with ENAMEL application.

ENAMEL will be added later to cover incisal 2/3.

Proximal view of DENTIN application.

Light cure: see chart 2

10. ENAMEL (E)



Apply ENAMEL, starting from incisal and feathering down to about the center of crown.

Note: For deeper cervical colour, add CERVICAL DENTIN.

After applying CERVICAL TRANSLUCENT.

After applying ENAMEL.

11. AIR BARRIER

Coat surface with GC GRADIA AIR BARRIER in usual manner.

Light cure: see chart 2

Light cure: see chart 2

12. FINAL LIGHT CURING



Use GC LABOLIGHT LV-II/LV-III for final cure then wash off GC GRADIA AIR BARRIER with water.

13. FINAL SHAPING



Shape, form and refine crown anatomy, with diamond and carborundum points.

Accentuate surface features with diamond and carborundum points then smooth with silicone points.

Polish & Buff
Use Robinson Wheel or similar on felt and/or chamois wheel for a together with GC GRADIA DIAPOLISHER, taken care not to damage the surface texture.

Use GC GRADIA DIAPOLISHER

Light cure: see chart 3



14. COMPLETED CROWN



Completed GC GRADIA crown –
labial view



Comparison of GC GRADIA crown to shade guide – Shade A2
GC GRADIA's brighter, deeper and richer colours provide superior
aesthetics and vitality versus conventional composites.



6. PHYSICALS / CURING TIMES / CURING DEPTHS

• PHYSICAL PROPERTIES

PRODUCT	GC GRADIA	Product A	Product B	Product C
Flexural strength (MPa)	124	61	123	158
Flexural modulus (MPa)	6,92	3,94	9,13	15,34
Flexural energy (MPa)	1,92	0,65	1,13	0,82
Occlusal wear (microns*)	8,7	7,7	12,3	5,7

* After 200,000 horizontal slide with a load of 1.70 MPa

* Values were measured by the research labs of GC Corporation, Tokyo

IRRADIATION TIME FOR THE PRE-CURING AND FINAL CURING PROCESSES

Light curing unit	GC LABOLIGHT LV-II, III		GC LABOLIGHT LV-I		GC STEP LIGHT SL-I	
	Pre-cure	Final cure	Pre-cure	Final cure	Pre-cure	Final cure
Foundation Opaque, Opaque, Margin Opaque	1 min.	—	3 min.	—	—	—
Dentin Opacus Dentin Opacus Dentin intensive Shoulder Dentin Enamel Pearl Enamel Halo Enamel Enamel Intensive Translucent Cervical Translucent	30 sec.	3 min.	1 min.	5 min.	10 sec. *	—
Intensive Color Mamelon stain	30 sec.	—	1 min.	—	10 sec. *	—

* For each surface of a single crown

• CURING DEPTH (WITH GC LABOLIGHT LV-III)

IRRADIATION TIME: 30 SEC.		CURING DEPTH IN MM		
Dentin	DA1, DA2, DB1, DB2, DC1, DD2	1.8	2.9	
	DA3, DA3.5, DB3, DC2, DC3, DD3	1.3		
	DA4, DB4, DC4, DD4	1.1		
OPAQUE DENTIN	ODA1, ODA2, ODB1, ODB2	1.5		
	OPAQUE DENTIN INTENSIVE	ODA3, ODA3.5, ODB3, ODC2, ODC3, ODD3, ODD4		1.0
		ODA4, ODB4, ODC4, ODI1, ODI2, ODI3, ODI4, ODI5, ODI6		0.9
SHOULDER DENTIN	SD2, SD3, SD4, SD5	1.6		
	SD7, SD8	1.1		
ENAMEL	E1, E2, E3, E4	2.5		
HALO ENAMEL	HE1	1.7		
ENAMEL INTENSIVE	EI1, EI3, EI5	2.6		
PEARL ENAMEL	PE1, PE3	2.3		
TRANSLUCENT	T0, T1, T2, T4, T5	2.9		
CERVICAL TRANSLUCENT	CT2, CT3, CT4	1.8		

IRRADIATION TIME: 1 MINUTE		CURING DEPTH IN MM.	
FOUNDATION OPAQUE	FO	0.25	2.9
MARGIN OPAQUE	MO	0.25	
OPAQUE	OA1, OA2, OA3, OA3.5, OB1, OB2, OC1, OD2, OD3	0.20	
	OA4, OB3, OB4, OC2, OC3, OC4, OD4	0.15	
MAMELON STAIN	MS2, MS3, MS5	0.4	
INTENSIVE COLOR	IC0(Clear), IC9(White)	1.5	
	IC1(Melon), IC7(Lavander), IC10(Corn), IC12(Black), IC13(Crack liner)	0.4	
	IC2(Pink), IC3(Yellow), IC8(Blue), IC11(Red),	0.2	
	IC4(Red brown), IC5(Brown), IC6(Olive green), IC14(Dark red brown)	0.1	

7. PACKAGING



■ GC GRADIA MASTER SET (10 shades)
A1, A2, A3, A3,5, B2, B3, B4, C2, C3, D3



■ GC GRADIA STANDARD SET (6 shades)
A2, A3, A3,5, B2, B3, C2



■ GC GRADIA INTENSIVE COLOR SET
(11 shades)



(11 shades)

GC GRADIA SEPARATOR



GC GRADIA DIE HARDNER



GC COMPOSITE PRIMER



GC METALPRIMER II



GC GRADIA DIAPOLISHER



GC GRADIA AIR BARRIER



GC GRADIA PASTE (2,9ml)



GC GRADIA SYRINGE PLUNGER



GC GRADIA SHADE GUIDE KIT



8. KIT CONTENTS AND INDIVIDUAL ITEMS

	MASTER SET (10 shades)	STANDARD SET (6 shades)	INTENSIVE COLOR SET (11 shades)	REFILL PACKAGES	
GC GRADIA Foundation Opaque	FO	FO		FO	Syringe 2,4 ml
GC GRADIA Margin Opaque	MO	MO		MO	Syringe 2,4 ml
GC GRADIA Opaque	OA1, OA2, OA3, OA3.5 OB2, OB3, OB4, OC2, OC3, OD3	OA2, OA3, OA3.5 OB2, OB3, OC2		OA1, OA2, OA3, OA3.5, OA4, OB1, OB2, OB3, OB4, OC1, OC2, OC3, OC4, OD2, OD3, OD4	Syringe 2,4 ml
GC GRADIA Opaqus Dentin	ODA2, ODA3, ODA3.5, ODA4, ODD4, ODB3, ODB4, ODC3, ODC4, ODI2	ODA3, ODA3.5, ODA4, ODB3, ODB4, ODC3		ODA1, ODA2, ODA3, ODA3.5, ODA4, ODB1, ODB2, ODB3, ODB4, ODC1, ODC2, ODC3, ODC4, ODD2, ODD3, ODD4	Syringe 2,9 ml
GC GRADIA Opaqus Dentin Intensive				ODI1, ODI2, ODI3, ODI4	Syringe 2,9 ml
GC GRADIA Shoulder Dentin	SD2, SD3, SD4, SD5, SD7, SD8			SD2, SD3, SD4, SD5, SD7, SD8	Syringe 2,9 ml
GC GRADIA Dentin	DA1, DA2, DA3, DA3.5, DD3, DB2, DB3, DB4, DC2, DC3	DA2, DA3, DA3.5, DB2, DB3, DC2		DA1, DA2, DA3, DA3.5, DA4, DB1, DB2, DB3, DB4, DC1, DC2, DC3, DC4, DD2, DD3, DD4	Syringe 2,9 ml
GC GRADIA Enamel	E2, E3, E4	E2, E3		E1, E2, E3, E4	Syringe 2,9 ml
GC GRADIA Halo Enamel	HE1			HE1	Syringe 2,9 ml
GC GRADIA Enamel Intensive	EI1, EI3	EI1		EI1, EI3, EI5	Syringe 2,9 ml
GC GRADIA Pearl Enamel	PE1, PE3			PE1, PE3	Syringe 2,9 ml
GC GRADIA Translucent	TO, T1, T2, T4			TO, T1, T2, T4, T5	Syringe 2,9 ml
GC GRADIA Cervical Translucent	CT2, CT3, CT4	CT2, CT4		CT2, CT3, CT4	Syringe 2,9 ml
GC GRADIA Mamelon Stain	MS2, MS3, MS5			MS2, MS3, MS5	Syringe 2,4 ml
GC GRADIA Intensive Color	IC7 (Lavender)	IC7 (Lavender)	IC0 (Clear), IC1 (Melon), IC2 (Pink), IC3 (Yellow), IC4 (Red brown), IC5 (Brown), IC6 (Olive green), IC7 (Lavender), IC8 (Blue), IC9 (White), IC10 (Corn)	IC0 (Clear), IC1 (Melon), IC2 (Pink), IC3 (Yellow), IC4 (Red brown), IC5 (Brown), IC6 (Olive green), IC7 (Lavender), IC8 (Blue), IC9 (White), IC10 (Corn), IC11 (Red), IC12 (Black), IC13 (Crack Liner), IC14 (Dark red brown)	Syringe 2,4 ml
GC Metalprimer II	○	○		5ml	
GC Composite Primer	○	○		3ml	
GC GRADIA Air Barrier	○	○		10ml	
GC GRADIA Separator	○	○		5ml	
GC GRADIA Die Hardner	○	○		5ml	
GC GRADIA Diapolisher	○	○		8 g	
Accessories	①~⑨	①~⑨		#1 GC GRADIA No. 1 Round brush: 10 pieces #2 GC GRADIA No. 1 Flat brush: 10 pieces #3 GC GRADIA No. 7 Brush: 3 pieces #4 GC GRADIA Brush handle (ivory or white): 1 piece #5 GC GRADIA Disposable mixing pad: 5 pieces #6 GC GRADIA Mixing pad cover: 1 piece #7 GC GRADIA No. 22 Mixing blocks: 1 set #8 GC GRADIA Shade chart - 1 piece #9 GC GRADIA Shade guide kit - 1 piece	

- Note:**
- 1) The shade combination chart is not available separately.
 - 2) The 2.9 ml syringe refill package does not include the re-usable plunger.

GC LIGHT CURING UNITS AND SPECIFICATIONS



GC STEPLIGHT SL-I

Power:	AC 220 V 50/60 Hz
Electric power consumption:	170VA
Lamp rating:	150 W
Dimensions:	115mm (width) 220mm (depth) 275mm (height)
Weight:	2 kg
Package:	1 main body



GC LABOLIGHT LV-III

Power:	AC 220 V 50/60 Hz
Electric power consumption:	90VA
Lamp rating:	27 W (3 pieces)
Turntable operating area:	90 mm (diameter) 9 x 70mm (height)
Dimensions:	185mm (width) 245mm (depth) 275mm (height)
Weight:	10kg
Package:	1 main body (with 2 turntables, 2 supporting mounts, supporting posts – 8 pieces each long/short)

9. QUESTIONS & ANSWERS



Q1. After sandblasting, if alloy surface is touched with fingers will bond strength of GC METALPRIMER II be affected?

A1. Yes. Sandblast alloy surface again and reapply GC METALPRIMER II.

Q2. Should sandblasted metal be ultrasonic or steam cleaned?

A2. No! The water may contain oil. Simply use filtered air pressure to remove aluminium oxide residue.

Q3. Opaque is a little thick when dispensing from syringe. Is this a problem?

A3. Not a problem! GC GRADIA pastes are thixotropic (certain gels exhibit this property but they become more fluid when stirred or put into motion, e.g. a syringe plunger). The thixotropic property helps control flow and prevents OPAQUE from pooling in undesired areas.

Q4. Can OPAQUE be diluted to improve flow?

A4. No, other than stirring it with a brush or spatula. GC COMPOSITE PRIMER and/or GC GRADIA INTENSIVE COLORS should not be used to dilute opaque pastes.

Q5. Can OPAQUE tooth shade be used instead of FOUNDATION OPAQUE?

A5. Yes, but it may require four very thin layers (each layer being light cured) in order to polymerize fully in undercut areas.

Q6. Is it possible to cover to the top of RETENTION BEADS II SSS with a single layer of FOUNDATION OPAQUE?

A6. Yes! The SSS BEADS are 100 μ , the curing depth of FOUNDATION OPAQUE is 300 μ . A single layer of FOUNDATION OPAQUE will be polymerized correctly in the undercut areas of the RETENTION BEADS II SSS.

Q7. OPAQUE did not cure.

A7. The OPAQUE layer might be too thick. Remove it and apply two very thin layers instead of one thick layer.

Q8. Is there a way of preventing cracks in composite bridges?

A8. Yes,

- Avoid applying large amounts of resin at one time between light cures.
- Create breaks where materials overlap.
- Build veneer by applying several thin layers, light curing them at each stage.

Q9. How can entrapping air bubbles be prevented?

A9. There are two ways:

- Before applying resin, lightly tap top of the paste surface with a spatula (spatula edge should not be nicked or rough. That will cause bubbles).
- Apply thin coat of GC COMPOSITE PRIMER to roughened resin surface. Light cure 1 min. before applying next paste layer.

Q10. Which paste should be used on hollow part of a pontic?

A10. Build-up with TRANSLUCENT. Contour to conform to adjacent area, light cure, then apply OPAQUE and light cure again.

Q11. Which light curing unit should be used?

A11. Those compatible with GC GRADIA – GC LABOLIGHT LV-III, GC STEPLIGHT SL-I. Units radiating ultraviolet light can not be used. They may cure surface monomer excessively, creating a non-bonding barrier between it and the next composite layer.

Q12. Can the brushes be cleaned?

A12. Yes! Clean thoroughly with pure alcohol (ethanol) after applying GC METALPRIMER II, GC GRADIA DIE HARDNER, GC GRADIA SEPARATOR, OPAQUES. Make sure that the ethanol dries off before re-using the tools. After using GC GRADIA AIR BARRIER, wash brush thoroughly with water.

Q13. Is it hard to remove composite inlays from working model?

A13. No! Apply GC GRADIA DIE HARDNER, block-out undercuts with wax then apply the GC GRADIA SEPARATOR.

Q14. How can the GC GRADIA SEPARATOR be removed from the composite surface?

A14. Either sandblast it off or clean it thoroughly with ethanol. Any residual separator on the composite surface has a negative effect on the adhesive cementation.

Q15. Can not get a good gloss on the composite?

A15. Apply GC GRADIA DIAPOLISHER to clean felt and/or chamois wheel and buff. Avoid using other polishing materials. A suitable silicone points finishing before final polishing allow to achieve better brightness.

Q16. Paste starts curing while working with it.

A16. Avoid working in bright sunlight (near a window) or within 30 cm from lab light. GC GRADIA is designed to promptly react to light for better physical properties.

Q17. Are there any contra indications?

A17. See page 33 of manual (Precautions). GC GRADIA can not be used with patients affected by mal occlusion, bruxism or clenching. There should be no occlusal contacts at metal composite margins.

Q18. How should GC GRADIA be stored?

A18. Store at room temperature and away from direct sunlight. For long term storage, keep in a dark, cool place. If refrigerated, remove at least 30 min before using for easy handling.

10. PRECAUTIONS



1. For use by dental professionals only.
2. GC GRADIA should not be used with patients having known sensitivity to methacrylates.
3. Persons similar effected should immediately stop using it and consult a physician.
4. Avoid contact with oral tissue, skin or eyes. If contact made, wash with water. If the eye is involved, immediately flush with water and seek medical attention.
5. Do not ingest or inhale any components of GC GRADIA.
6. Do not use these liquids near open flames, other sources of heat or sunlight. Flammable liquids are GC COMPOSITE PRIMER, GC METALPRIMER II, GC GRADIA SEPARATOR and GC GRADIA DIE HARDNER.
7. Do not mix components of this product with other products.
8. Do not use ultraviolet lights or visible light curing units that can radiate ultraviolet light.
9. Do not look directly into curing lights.
10. Product can be refrigerated but must be brought to room temperature for easy handling (approximately 30 minutes).
11. The material should be used immediately after extrusion from syringe. Keep tightly sealed.
12. Avoid inhaling dust while grinding or polishing. Use a dust mask.
13. Brushes in the kit should be used exclusively with this product.
14. Do not use this product in any way other than as indicated in the instructions.

Note:

1. Use GC GRADIA within 2 years from manufacturing date.
2. Keep light curing units clean and replace lamps when required.
3. Remove excess liquid paste from around syringe nozzle.
4. GC METALPRIMER II brush should be used exclusively for that purpose.

Note: Vita® is a registered trademark of Vita Zahnfabrik, Bad Säckingen, Germany



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