



One-shade
simplicity and
aesthetic invisibility



GC GRADIA DIRECT
Light-Cured
Composite Restorative

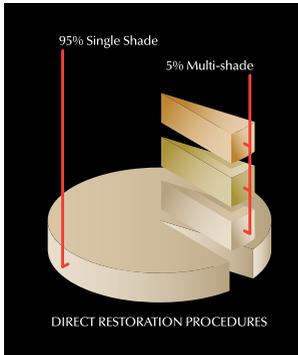
CLINICAL GUIDE

All clinical cases by Dr. Nassib Farès, Beirut, Lebanon



Why?

The need for beautiful aesthetics, simply achieved



Advances in aesthetic dentistry and wide-spread publicity of what nowadays can be achieved, have led more and more patients to expect that a restoration will perfectly match their surrounding teeth.

The choice of a direct restoration however, can present the dentist with a dilemma. No matter what the case, traditional materials often take several shade layers to create a good match or 'chameleon effect' with neighbouring teeth. This makes the procedure more complex, time-consuming and ultimately more expensive for both dentist and patient. Not surprisingly, aesthetics is often compromised for the sake of simplicity and cost. Indeed, 95% of direct restorations are carried out with just one shade even though the patient may not get the look they want.



Vol. 23, No.10 Dec. 2006

The excellent aesthetics achievable with GRADIA DIRECT, its ability to blend with surrounding tooth structure, outstanding handling properties without stickiness and the simplicity of the shade system were all highlighted by THE Dental Advisor and Reality.

GC gradia direct

With GRADIA DIRECT from GC you can forget compromise! A new direct restorative created for today's dentistry, it meets the needs of both patients and dentists by giving a superb natural-looking restoration in most cases with a single shade. And if higher-end aesthetics is required or if the class of restoration demands, a selection of special shades can be added very easily. It also means the dentist has more opportunities to perform modern minimum intervention dentistry to the aesthetic satisfaction of the patient.



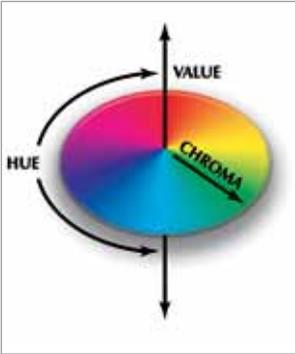
Before restoration



After restoration

GC gradia direct

Optical properties determine the 'look' of a natural tooth



Colour is the optical property which contributes most to the appearance of a tooth.

It is actually a three-dimensional space composed of:

- hue - the pure colour itself
- chroma - the saturation of the colour
- value - the lightness or darkness of the colour

In dentistry, the nature of tooth structure also brings into play other optical properties, such as translucency, opalescence and fluorescence.



Perfect translucency and opalescence

How these optical properties are perceived and hence the tooth's appearance, is determined by the way the tooth reflects light back into the viewer's eye. There are two types of reflection:

- Mirror reflection is when all wavelengths are reflected back to the eye.
- Diffuse reflection occurs when light within the tooth is reflected off the complex series of interfaces and this type of reflection is responsible for how the tooth's hue, chroma and value are actually perceived as well as its translucency and opalescence.

Clinical guide

Particle structure imitates reflectivity of a natural tooth

By studying the tooth's optical properties it became clear that the closer a restoration material could mimic the internal structure of a natural tooth, the closer would be their appearance within the mouth.

To achieve this, the material of GRADIA DIRECT consists of a micro-filled matrix of resin composite with compounds mainly of silica and pre-polymerised fillers. The amount of each constituent and its particle size distribution has been carefully chosen so that when added together, many different interfaces occur with different reflective properties. The result is a diverse, multifaceted internal structure, similar to the natural tooth, which creates an internal reflectivity that accurately reproduces the reflectivity of natural tooth.



Natural reflectivity means natural aesthetics

Indeed, the chameleon effect with the surrounding natural teeth is so good that the restoration is aesthetically 'invisible' often with a single shade layer and gives outstanding highend aesthetics when further shades are used.

GC gradia direct

Structure works with unique Shade System

Gradia Direct Anterior 22 shades

Standard



Inside Special



Outside Special



Gradia Direct Posterior 6 shades

Standard



Outside Special



Gradia Direct X 6 shades

Standard



Inside Special



Outside Special



XBW: Extra Bleach White
BW: Bleach White
CV: Cervical
CVD: Cervical Dark
DT: Dark Translucent
CT: Clear Translucent
GT: Grey Translucent
NT: Natural Translucent
WT: White Translucent
CVT: Cervical Translucent

Standard and Inside Special shades are based on the Vita® Shade Guide.

To give shades that work with the material's unique multifaceted internal structure, and meet the needs for the single shade and multi-shade technique, a unique range of shades has been developed where each shade has been perfectly adapted in terms of its hue, chroma, value and translucency.

Clinical guide

Standard Shades

For the single-shade and multi-shade technique in both anterior and posterior restorations.

Special Shades

For the multi-shade technique, of which there are two versions:

- **Inside Special shades**

These are for anterior restorations only. For use underneath Standard Shades, they have a higher opacity in order to block out unwanted 'dark shine' through the mouth.

- **Outside Special shades**

These are for anterior and posterior restorations. For use on top of Standard Shades, they mimic the value and translucency of enamel giving restorations a very 'life-like' appearance.

Further details on the shades available as well as when and how to use them are described in the next section.

GC GRADIA DIRECT

Anterior

This version is for:

- Class III, IV and V cavities
- wedge-shaped defects and root surface cavities
- veneers and diastema closure

GC GRADIA DIRECT

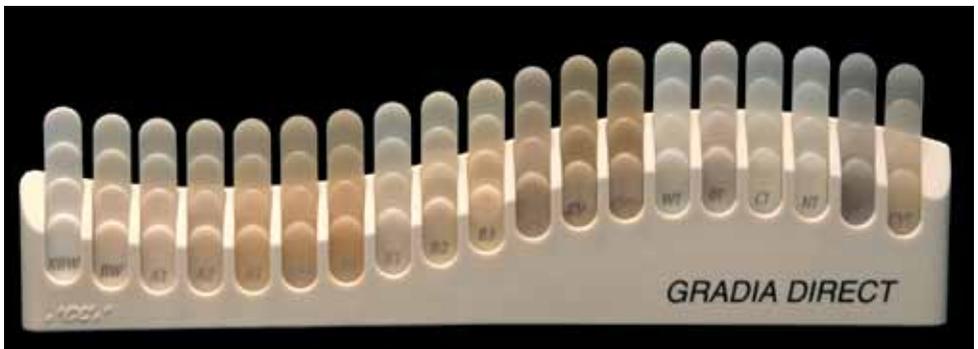
Posterior

This version is for:

- Class I and II cavities
- when radiopacity is required

Shade Guide

Standard Shades and Inside Special shades are based on the VITAPAN Classical® Shade Guide but some of the Outside Special shades are unique, so to aid selection there is a simple to use GRADIA DIRECT Shade Guide. Each shade is a wedge shaped 'finger' of increasing thickness to help dentists judge the influence of material thickness on a particular shade.



GC gradia direct

All the properties for a long-lasting restoration

As well as giving outstanding aesthetics, GRADIA DIRECT has all the other properties you would expect for a restoration material:

Good polishability

For improved aesthetics, GRADIA DIRECT polishes quickly and easily to a smooth, glossy surface.

Tough and flexible

To resist bending and occlusal forces as well as the spread of cracks, GRADIA DIRECT has high fracture toughness and a low modulus of elasticity.

High wear resistance

Essential for posterior restorations, GRADIA DIRECT is very durable, resisting occlusal wear exceptionally well, yet there is low wear on opposing dentition.

Light curable

GRADIA DIRECT can be light cured using a quartz halogen, plasma arc or LED light. There is minimum colour change before and after light curing.

Radiopaque

The posterior version of GRADIA DIRECT is radiopaque.

Clinical guide



When and how?

Single-shade for most cases

Around 95% of restorations are performed with a single shade layer. Use a single shade of GRADIA DIRECT for cavity Class I, II, III and V restorations.



Class I



Class II



Class III



Class V

TECHNIQUE

1 Shade selection

After cleaning the tooth with pumice and water, select shade prior to isolation, assisted by the GRADIA DIRECT Shade Guide. For the single shade technique choose ONE Standard Shade from the range. These shades are based upon the VITAPAN Classical® Shade Guide and have a very delicate balance between hue, chroma, value and translucency.

- for anterior cavities
There are Standard Shades grouped into A shades (reddish-brown), B shades (reddish-yellow) and C shades (Grey). In addition, there are two bleach shades – XBW and BW White (BW) and two cervical shades - Cervical (CV) and Cervical Dark (CVD).
- for posterior cavities
There are Standard Shades in the A shade group only.

2 Cavity preparation

The cavity is prepared using standard techniques.



Cavity preparation

3 Bonding

For bonding GRADIA DIRECT to enamel and/or dentine use a light-curable system such as G-BOND or Fuji BOND LC. In the case of deep cavities, place a flowable composite such as GRADIA DIRECT Flo on the cavity floor. Fuji LINING PASTE PAK or Fuji LINING LC can also be used as a liner. For the sandwich technique Fuji IX GP (Fast) or Fuji II LC are the materials of choice as a base material.

Single shade



G-BOND

4 Placement

Your chosen Standard Shade can be dispensed via:

- Single-dose Unitip - directly into the cavity.



Fuji BOND LC



Fuji IX GP (Fast)

- Syringe - onto a mixing pad and then into the cavity using a suitable placement instrument.



5 Contour

Contour before light curing, using standard techniques.



6 Light-cure

After contouring, light cure (see details on page 20).



When and how?

7 Finishing and Polishing

Finish and polish using standard techniques.



Finish with diamond bur



Result with rubber dam



Polish with disc



End result

Single shade

Example results



CLASS I



CLASS II



CLASS III



CLASS V

When and how?

Multi-shade for higher aesthetics or larger cavities

To achieve the very best aesthetic results in any Class of restoration from I to V, or for larger cavities such as a Class IV restoration, use Special Shades in combination with the Standard Shade.



Class IV



Class I



Class II



Class III



Class V

Multi shade

Shade selection

After cleaning the tooth with pumice and water, select shades prior to isolation, assisted by the GRADIA DIRECT Shade Guide. For the multi-shade technique the following shades are selected, depending on whether it is for an anterior or posterior restoration.

Standard Shades

For anterior or posterior cavities, choose the Standard Shade in the same way as for the single-shade technique.

Inside Special Shades

For an anterior cavity, choose the Inside Special shade to go underneath

the Standard Shade.

Inside Special shades have a higher opacity (i.e. lower translucency) than standard shades and are used to:

- block out unwanted 'dark shine' through the mouth or to mask discoloured dentin
- replace dentin in cases of substantial loss of tooth structure, such as in larger cavity Class III and Class IV restorations

The shades available are AO2, AO3 and AO4, where each has a similar hue but increased chroma content. Translucency is kept at the same level.

Outside Special Shades

The enamel surface gives 'life' and vitality to the tooth and it is this which is the main contributor to the value reading of a tooth. Value is often underestimated in its importance compared to hue and chroma, but in fact choosing the correct value first, achieves 60% of the final 'colour', picking the correct chroma next gives 90% of the 'colour' and the final 10% is reached by selecting the right hue. Value is best determined by looking at the incisal and approximal sites of the tooth.



Standard Shade



Inside Special Shade



The influence of wrong value on end result

When and how?

For anterior or posterior cavities, choose the Outside Special shade to go on top of the Standard Shade.

Outside Special shades vary in their translucency and value (black/white levels) so enabling you to reproduce the influence of enamel on aesthetics.

They are used to:

- give more 'life' to the appearance of the final restoration
- to match changes in enamel over time in order to suit different age groups.

Enamel changes with increasing age from thick in a child, to thin in an older person. This change is accompanied by a reduction in value, high (whiter) to low (darker). To copy this change in value there are the following Outside Special Shades:



White Translucent (WT)
FOR JUNIORS

Natural Translucent (NT)
FOR YOUNG ADULTS

Dark Translucent (DT)
FOR ADULTS

Grey Translucent (GT)
FOR SENIORS

At the same time as the thickness of enamel decreases, the translucency of the enamel increases. To mimic this change, for example at the incisal edges of teeth from adult and elderly patients, there are the following Outside Special Shades:



Clear Translucent (CT)

Special attention must also be paid to the aesthetics in the cervical area. To mimic this change and particularly to increase the vividness of Class V restorations, use the Outside Special shade:

Cervical Translucent (CVT)

Multi shade

Shade Combination Chart

To help choose the most suitable multiple shade layers for large cavities in anterior teeth, use the chart below:

SHADE	A1	A2	A3	A3.5	A4	B1	B2	B3	C3
Inside Special	BW	AO2	AO3	AO3	AO4	BW	AO2	AO3	AO4
Standard Shade	A1	A2	A3	A3.5	A4	B1	B2	B3	C3
Outside Special	WT	DT	DT	DT	DT	WT	WT	DT	DT

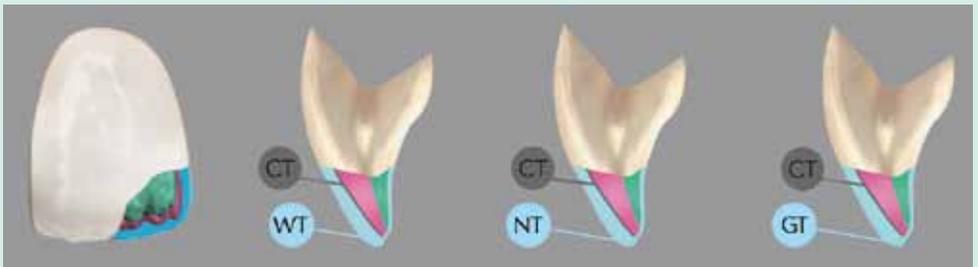
Multi-shade technique: build-up guide

Class IV

Junior

Adult

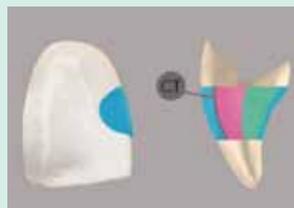
Senior



Class I and II

Class III

Class V



When and how?

Example results

Class IV



Start Pre-operative



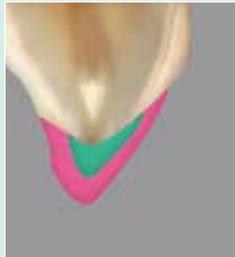
Long bevel used to aid shade adaptation



Inside Special Shade AO2



Standard Shade A1

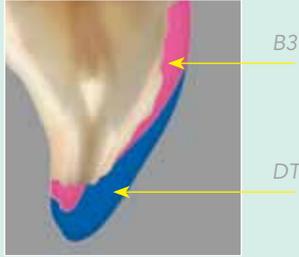


Outside Special Shades DT and NT

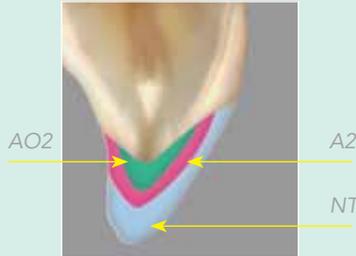


Multi-shade

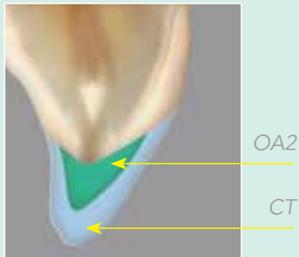
Direct Veneer



Class IV



Class IV



When and how?

General guidelines

Light-curing

After contouring, light cure as per the tables below. In the multi-shade technique the material should be placed and light cured in layers. For maximum layer thickness, please consult the tables.

Irradiation time and effective depth of cure

GC GRADIA DIRECT ANTERIOR:				
Shade	Irradiation time	Plasma arc (2000mW/cm ²)	3sec.	6sec.
		GC G-Light (1200mW/cm ²)	10sec.	20sec.
	Halogen/LED (700mW/cm ²)	20sec.	40sec.	
CT, NT, WT, GT, CVT, X-A1, X-B1, X-WT			3.0mm	3.5mm
A1, A2, B1, B2, XBW, BW, DT, X-A2, X-A3, X-B2, X-C2, X-D2			2.5mm	3.0mm
A3, B3, X-A3.5, X-AO2, X-XBW, X-BW			2.0mm	3.0mm
A3.5, A4, C3, AO2, AO3, AO4, CV, CVD			1.5mm	2.5mm
GC GRADIA DIRECT POSTERIOR:				
Shade	Irradiation time	Plasma arc (2000mW/cm ²)	3sec.	6sec.
		GC G-Light (1200mW/cm ²)	10sec.	20sec.
	Halogen/LED (700mW/cm ²)	20sec.	40sec.	
P-A1, P-A2, P-WT, P-NT			2.5mm	3.0mm
P-A3, P-A3.5			2.0mm	3.0mm

What?

Packages available

GRADIA DIRECT

GRADIA DIRECT together with G-BOND for bonding and Gradia Direct Flo for lining cavities forms a complete system for creating direct restorations.



Complete kits do not contain B1 and XBW

SHADES

22 Anterior Shades

Standard:

XBW, BW, A1, A2, A3, A3.5, A4, B1, B2, B3, C3, CV, CVD

Inside Special:

AO2, AO3, AO4

Outside Special:

DT, CT, GT, NT, WT, CVT

6 Posterior Shades

Standard:

P-A1, P-A2, P-A3, P-A3.5

Outside Special:

P-WT, P-NT

6 X-shades

Standard:

X-A1, X-A2, X-A3, X-A3.5

Inside Special:

X-AO2

Outside Special:

X-WT

PACKAGES UNITIPS

Complete kit:

All available Standard, Inside Special and Outside Special shades except B1 and XBW and a Shade Guide

Introductory kit:

5 Unitips each of A2, A3, A3.5, AO3, CV, CT, P-A2 and a Shade Guide

Refill:

20 Unitips of: A1, A2, A3, A3.5, AO3, CV, DT, NT, P-A1, P-A2, P-A3, P-A3.5, P-WT, P-NT, X-A1, X-A2, X-3, X-3.5, X-WT

10 Unitips of: A4, B1, B2, B3, C3, AO2, AO4, CVD, BW, XBW, CT, WT, GT, CVT, X-AO2

Volume per Unitip: 0.16 ml
Weight per Unitip: 0.24 g

for anterior and 0.28 g for posterior

PACKAGES SYRINGES

Complete kit:

26 syringes of all available Standard, Inside Special and Outside Special shades except B1 and XBW and a Shade Guide

Introductory kit:

7 syringes of: A2, A3, A3.5, AO3, CV, CT, P-A2 and a Shade Guide

Refill:

1 syringe of the available colours

Accessories

Unitip Applier

Shade guide

Volume per syringe: 2.7ml

Weight per syringe: 4g for anterior and 4.7g for posterior

What?

Complementary GC products



G-BOND

G-Bond is a state-of-the-art, self-etching, easy-to-use, light-cured adhesive which utilises both chemical and micro-mechanical adhesion principles. The two functional monomers, 4-MET and Phosphoric Acid Ester, combine with nanofilled particles to form a unique and stable nanofilled interface with the dentine - the Nano Interaction Zone (NIZ) - whilst offering a reliable adhesion to enamel at the same time.



Gradia Direct LoFlo

Gradia Direct LoFlo, the first flowable to be considered as a real restorative, not only for class V or as a liner, but also for class I, class II and class III restorations. Introducing the new High-Density Radiopaque (HDR) technology, GC offers a flowable restorative with unsurpassed physical properties.

Gradia Direct Flo

Gradia Direct Flo is a light-cured, radiopaque micro hybrid resin specially designed for use in combination with Gradia Direct. Thanks to its physical properties, proper flow characteristics and direct application by syringe, this material is ideal as a liner under composite restorations.



What?

Complementary GC products



Fuji IX GP (Fast)

The packable non-sticky consistency of Fuji IX GP (FAST) makes it ideal to be used in Class V, I & II restorations, as base or as core build-up material. The genuine glass ionomer properties, in combination with the ease of use, ensure that Fuji IX GP (FAST) can meet all your demands on modern restorative materials.



Fuji LINING LC Paste Pak

Powder-liquid type of light-cured cement for fast linings under amalgam, composite and porcelain



Fuji LINING LC

Paste-paste light-cured resin modified GIC for all your fast and reliable linings. Combines accurate dispensing with magnificent handling.



Fuji II LC Improved

Fuji II LC Improved is the worldwide leading light-cured glass ionomer restorative. Although designed primarily as a restorative material for use in Class III, V and deciduous teeth, Fuji II LC Improved is a multipurpose material, with secondary indications such as liner, base and core build-up.

GC EUROPE N.V.

Head Office
Researchpark Haasrode-Leuven 1240
Interleuvenlaan 33
B – 3001 Leuven
Tel. +32.16.74.10.00
Fax. +32.16.40.48.32
info@gceurope.com
<http://www.gceurope.com>

GC UNITED KINGDOM Ltd.

12-15, Coopers Court
Newport Pagnell
UK – Bucks. MK16 8JS
Tel. +44.1908.218.999
Fax. +44.1908.218.900
info@uk.gceurope.com
<http://uk.gceurope.com>

