

# DENTAL FOCUS

BY  
ITENA  
CLINICAL

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 **ITENA**<sup>®</sup>  
CLINICAL PRODUCTS

# introduction

Dear Doctor,

I am pleased to share with you our ITENA Clinical newsletter, Dental Focus which we have created to share clinical cases and information about our company. For over 15 years, ITENA Clinical has made every effort to provide dental surgeons all over the world with innovative products to help make their operations run easier and more efficient. Thanks to your business there has been much success in our products, and I'd like to take this opportunity to thank you for being a loyal customer.

How do we set ourselves apart in a business environment that already has a number of operators competing instead of jostling for success?

## We use networks of local distributors to help us maintain a closer relationship with our end users.

ITENA Clinical produces state-of-the-art products, and has chosen to make its solutions available via a vast network of distributors (we are active in 90 countries, and 3 years ago established a new affiliate in the USA). Our products are born in our Research and Development department, which works with Dental Surgeons and partner Universities to provide you with the best possible solutions to meet your needs.

## A vast range of products, taking innovation to the next level

We work to create a reliable coherence between the lines of product you use every day, setting originality apart from innovation which is what your practice needs. In the current "race for profitability", the work of our R&D team must focus on solutions that are genuinely useful to both you and your patients.

## Quality for both you and your patients

Here at Itena our primary focus is to provide you with high-quality products. Every day millions of patients are seeking dental treatment which means our products are being utilized all the time. Because you as a customer have not only trusted us with your practical needs, but also with your patients' smile, we owe you the best-quality products.

The next edition of Dental Focus has already been written, although if you would like to have a clinical case of your own published in an upcoming issue, please feel free to send the details or articles to us at: [contact@itena-clinical.com](mailto:contact@itena-clinical.com)! We would be more than happy to include them in our future publications.

I hope you enjoy reading this special issue. Warmest regards,

Lionel DESCOQS, CEO ITENA Clinical

Manon GABELOUT  
Project Manager ITENA Clinical  
Nicolas BERTOLINO  
R&D Director ITENA Clinical

## DENTOCLIC GLASS FIBER DENTAL POSTS: THE IDEAL CROWN-AND-ROOT ANCHORING SOLUTION FOR HIGH-QUALITY AESTHETIC RECONSTRUCTIONS.

Destruction of important dental tissue, through carious attack or fracture, can mean practitioners have to carry out root canal treatments. When there is too much crown decay, reconstruction must often make use of a root anchorage to encourage retention.<sup>[1]</sup>

Using glass fiber dental posts is less invasive and more sensitive to dentine tissues than reconstruction with a metallic core inlay. The absence of metal within the reconstructed structure means the fiber dental posts can be perfectly integrated, both aesthetically and biologically. Due to this, it is clinically essential that the post's material possesses excellent mechanical, translucent and radio-opaque properties.

Furthermore, the expected characteristics must be the closest possible to dentine so that a heterogeneous system is not created inside the reconstructed tooth.<sup>[2][3]</sup>

### Dentoclic fiber dental posts

Without any metallic components, Dentoclic fiber dental posts are intended for high-quality aesthetic crown-and-root reconstructions.

The dental posts are shaped in a tapered cylinder, combining the retention properties of a cylindrical post and respecting the sensitivity of radicular tissues.<sup>[4]</sup>

If necessary, they can also be removed very rapidly, without trauma, during new treatments.

Dentoclic fiber dental posts are manufactured following the pultrusion process, a continuous fiber tube manufacturing technique. This process is well time-tested and has now been used to manufacture optimised fiber dental posts continually for over 10 years.

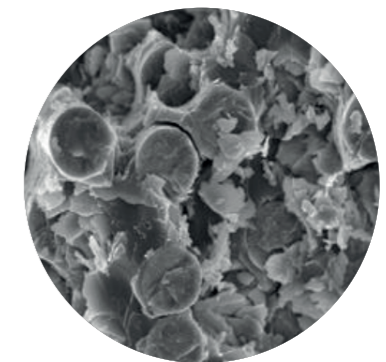
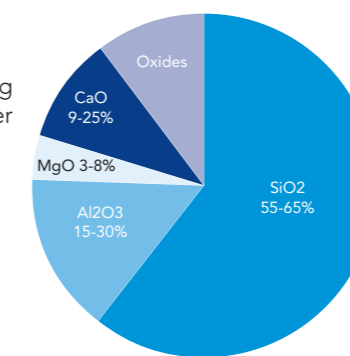
### Dentoclic fiber dental post manufacturing



This process resulted in finding the optimal fiber/matrix ratio, guaranteeing Dentoclic glass fiber posts the best properties.<sup>[5]</sup>

### Fiber composition

Type E glass fiber are composed of the following elements: SiO<sub>2</sub>, CaO, B<sub>2</sub>O, Al<sub>2</sub>O<sub>3</sub> as well as other oxides present in the amorphous phase



## Composition of material

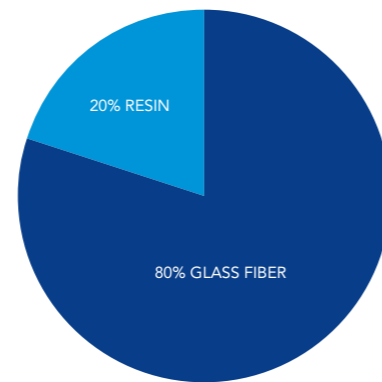
Dentoclic fiber dental posts are made of two homogeneous and uniform phases (fiber/resin). Type E glass fiber are all unidirectional and incorporated into a biocompatible resinous matrix.

The composition of Dentoclic dental posts is 80% glass fiber and 20% resinous matrix.

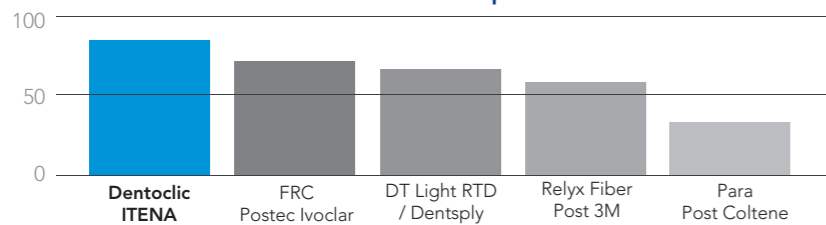
This high concentration of glass fiber grants the material its excellent mechanical properties, while retaining the good elasticity of fibre reinforced systems.<sup>[6]</sup>

Indeed, Novais et al. (2016) established a correlation between the structural composition of glass fiber dental posts and the associated mechanical performances. It was concluded that flexural strength was directly correlated with the fiber/matrix ratio.<sup>[7]</sup>

Fiber/matrix ratio



Fiber concentration in Dentoclic dental posts



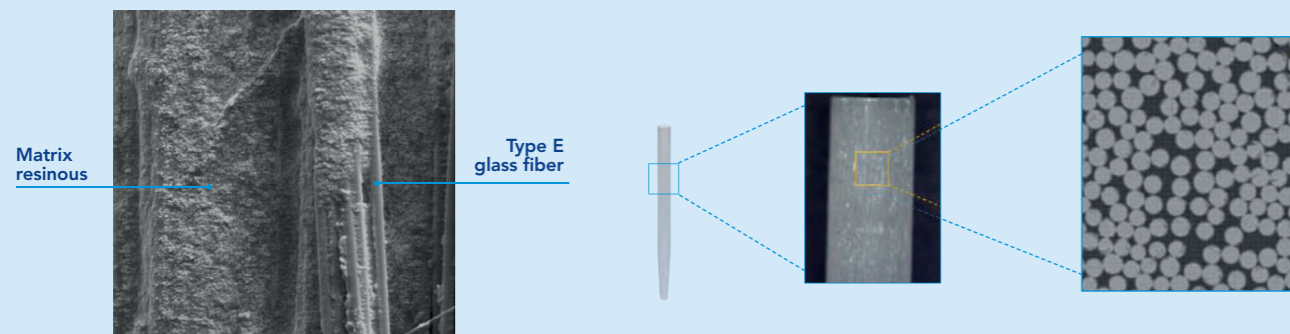
Dentoclic glass fiber dental posts possess the highest fiber/matrix ratio of the above products available on the market.<sup>[7]</sup>

## Material structure

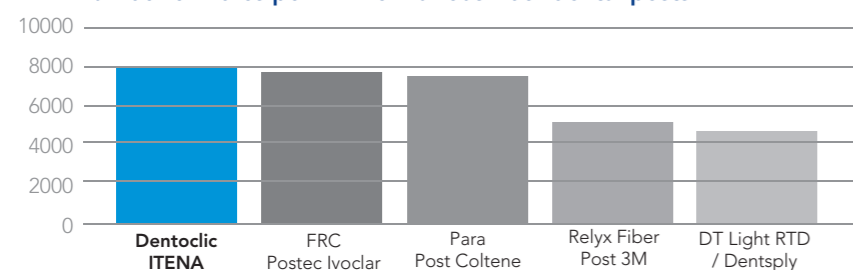
Dentoclic glass fiber dental posts are positioned longitudinally in the matrix, giving the dental post excellent resistance against mechanical strains taking place inside the mouth.

The homogeneity of the fiber organization inside the matrix enables the fiber composite to be perfectly adapted for crown-and-root applications.

It has also been shown that the number of glass fiber per mm<sup>2</sup> on the inside of each dental post was directly correlated to the material's mechanical performances. Due to the manufacturing process, Dentoclic glass fiber dental posts have around 8,000 glass fiber per mm<sup>2</sup>.



Number of fibres per mm<sup>2</sup> of various fiber dental posts



Dentoclic glass fiber dental posts thus possess the highest number of glass fiber inside the dental post compared to the above products available on the market.<sup>[7]</sup>

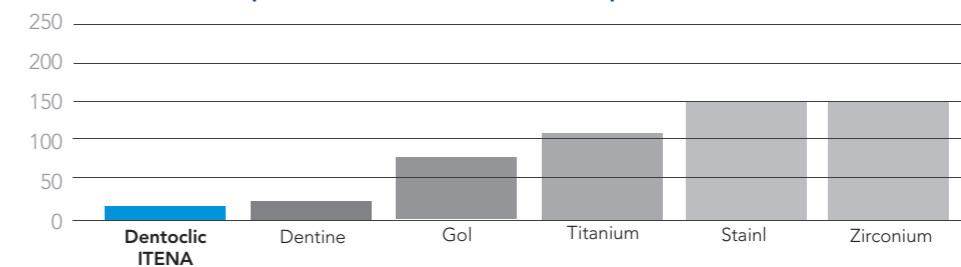
## Material properties

Young's modulus is the elastic constant of a material under stress, which characterises its rigidity.

The Young's modulus for Dentoclic fiber dental posts is

largely comparable to dentine, which grants it a slight flexibility during chewing, easing stresses and reducing the likelihood of root fracture.

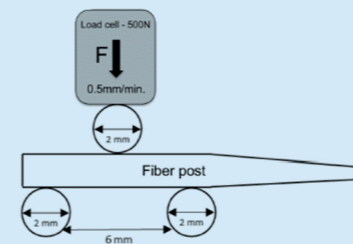
Number of fiber per mm<sup>2</sup> of various fiber dental posts



## Flexural/fracture strength

Flexural strength is the maximum resistance of a material before it fractures. This property is clinically important, particularly for the process of chewing, when various forces are exerted that put pressure on dental posts.

Stewardson et al. (2010) showed that fiber glass dental posts provide a high flexural strength, higher even than that of gold and stainless steel.<sup>[8]</sup>



The fracture strength of Dentoclic fiber glass dental posts is measured according to the international standard ISO 10477, following a 3 point flexural strength test.

This flexural resistance value of Dentoclic dental posts is attributed to the large quantity of longitudinal glass fiber present in the dental posts as well as their homogeneity within the matrix.

## Stress distribution

Loss of substance due to decay, root canal filling and structural modifications to dentine tissue represent the main causes of weakness for a pulpless tooth.

Teeth that have been heavily reconstructed can retain normal function but a large number of fractures occur due to constant strain.

Compared to other materials, fiber dental posts have the best resistance to strain.<sup>[9]</sup>

In addition, in a normal environment, stresses are spread uniformly throughout the tooth. Thanks to glass fiber absorbing and distributing the pressure undergone by the tooth equally, Dentoclic fiber dental posts elicit a mechanical biomimicry, adopting natural behaviour.

Distribution of forces



## Types of fracture

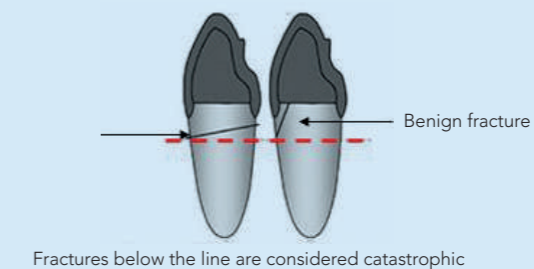
Reconstructions using glass fiber dental posts show various fracture types, throughout which the dental posts deform at the apical end. Fiber dental posts are more subject to cervical fractures, which are easier to repair (Dietschi et coll., 2008).<sup>[10]</sup>

These fractures are considered benign failures and can be treated without having to take out the tooth.

In addition, Akkayan & Gulmez (2002) showed that in 100% of the cases, a fracture restored using a metallic dental post proved to be catastrophic against 40% of restoration cases using glass fiber dental posts.<sup>[11]</sup>

Finally, the most frequent type of failure during reconstruction using fiber dental posts is mainly due to decementation and not fracture, which can be retreated. (Kulkarni et al., 2016)<sup>[12]</sup>

Diagram of fracture types for glass fiber dental posts



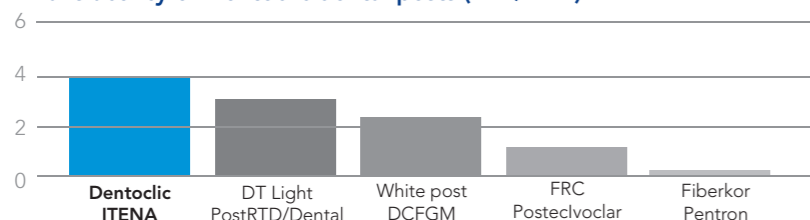
## Translucency

Translucency is the transmission or the reflection of light from a substrate surface through a non-transparent medium. The translucency of a material is a concept in physics that characterizes a material's ability to let light pass through. For a dental post, good translucency has two advantages:

- A significant aesthetic result, with the most natural reconstructions possible
- A facilitated diffusion of light through the material during photo-polymerisation [13]



Translucency of Dentoclic dental posts (mW/mm<sup>2</sup>)

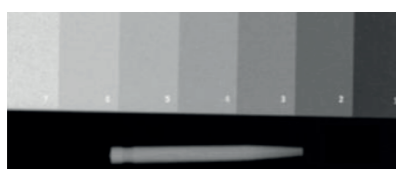


Dentoclic glass fiber dental posts possess the highest translucency values compared to the above products available on the market. [6]

## Radiopacity

The radiopacity of a glass fiber dental post is important because it means it can be identified clearly on an x-ray when it is surrounded by tooth, bone tissue and reconstruction materials.

Dentoclic glass fiber dental posts possess increased levels of radiopacity, which makes them more easily identifiable on x-rays. [14]



4 mm Al

## Satisfaction of practitioners

The post marker clinical follow-up allows us now to affirm that 99.9% of dental surgeons over the world are satisfied with the clinical performance of Dentoclic glass fiber dental posts

Dentoclic glass fiber dental posts are available in several diameters, from 1 to 1.4 mm, in order to meet the needs of all cases that come up during crown-and-root reconstructions. Two levels of translucency are available

99,9%

Satisfaction level  
(Study carried out 2003-2018) [15]

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- [3] Restauration de la dent dépulpée: Concepts & Préceptes [Pulpless tooth reconstruction: Concepts & Precepts] – Dr. Dervisevic – Université de Lorraine – 2011
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- [5] Dentoclic Technical File – Description of manufacturing Process – ITENA Clinical
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- [7] Correlation between the mechanical properties and structural characteristic of different fiber posts systems – Novais et al. – Brazilian Dental Journal – 2016
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- [11] Resistance to fracture of endodontically treated teeth restored with different post systems – Akkayan and Gülmez – The Journal of Prosthetic Dentistry – 2002
- [12] Evaluation of the Mode of Failure of Glass Fiber Posts: An in vitro Study – Kulkarni et al. – International Journal of Scientific Study – 2016
- [13] Translucency of human teeth and dental restorative materials and its clinical relevance – Young-Keun Lee – Journal of Biomedical Optics – 2015
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- [15] DENTOCCLIC Clinical Evaluation Report – ITENA Clinical

## DISGUISED A CANINE AS AN INCISOR BY LAYERING IN A CASE OF TOOTH 12 AGENESIS

A young male patient at the age of 14 and a half came in for a consultation following his orthodontic treatment. He had agenesis of tooth 12 and his orthodontic treatment had consisted of the mesialisation of tooth 13 onto the site of tooth 12.



The reason for consultation was the aesthetic issue caused by the morphology of tooth 13 in the site of tooth 12, and significant asymmetry in the patient's smile (fig. 1 and 2). Given the patient's young age, we turned to a therapeutic solution that favoured tissue preservation. This was using a direct method to disguise tooth 13 as tooth 12 by adding composite.

The dental technician first created a wax-up from the plaster model (fig. 3).

After confirming the treatment plan with the patient, we produced a silicone key to use as a guide for assembling the composite on the palatal surface (fig. 4 to 6).

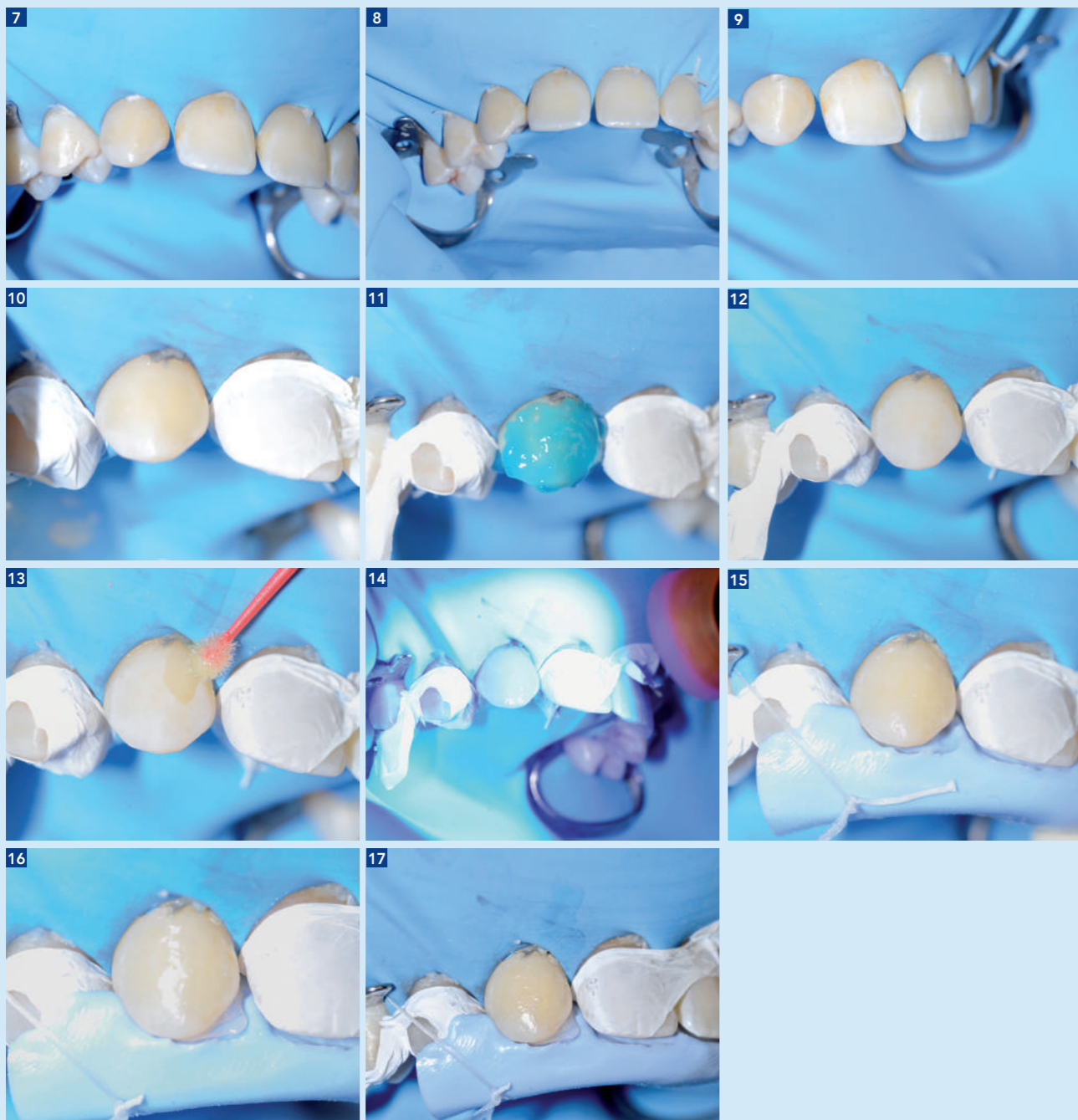
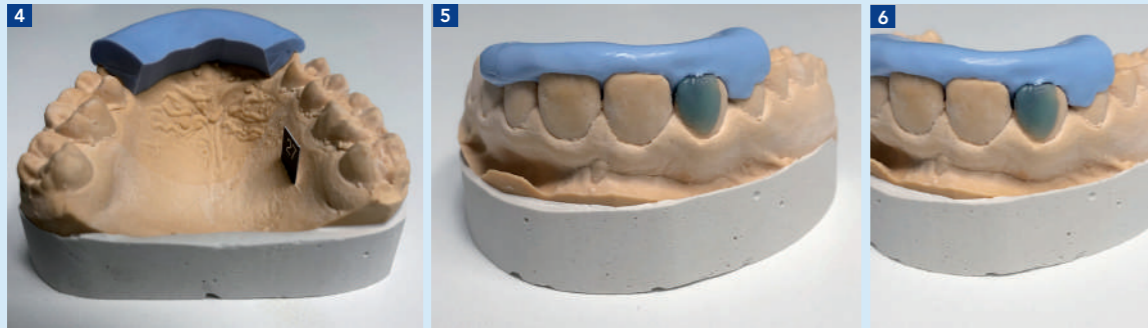
The operative field was implemented over a large area to enable correct positioning of the silicone key (fig. 7 to 9). The adjacent teeth were protected using Teflon tape (fig. 10).

A 37% phosphoric acid enamel etching (DentoEtch, ITENA Clinical) (fig. 11) was then used, followed by rinsing and drying (fig. 12). We then proceeded to apply the adhesive system (Iperbond Ultra, ITENA Clinical) by rubbing the surfaces for 20 seconds (fig. 13), followed by moderate air drying, then light curing for 20 seconds (fig. 14).

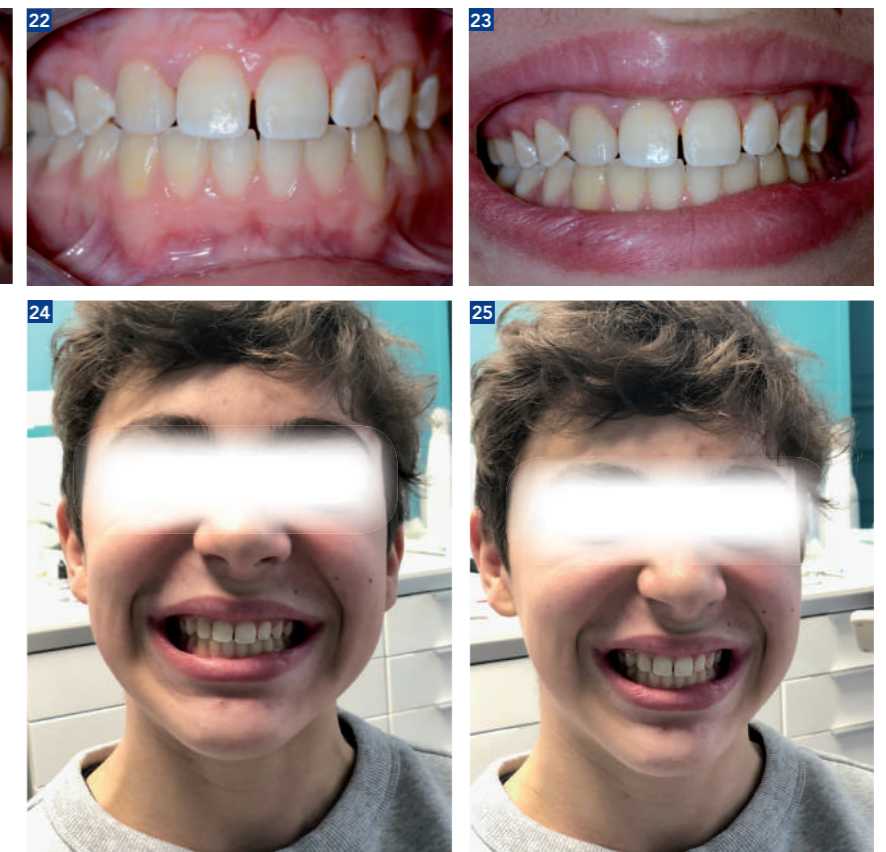
The silicone key was put into position and secured by thread using two clamps (fig. 15).

An initial layer (enamel shade) of composite was placed on the palatal surface (Reflectys universal composite, ITENA Clinical) (fig. 16 and 17),





then a dentine mass was placed by layering (fig. 18), then a layer of enamel (E) and finally we used incisal composite (I) to mimic the white marks (fig. 19). The dental dam was removed, and we checked the MIO, lateral and protrusive movement of the occlusion (fig. 20). Finally, the restoration was polished (Perfect Polish, ITENA Clinical) (fig. 21). Final result (fig. 22 to 25).



## A JOB FOR REFLECTYS

Direct composite restorations of posterior teeth are now a standard procedure in modern conservative dentistry. Although less exposed to view, the precise reproduction of their occlusal anatomy presents no less of a challenge.

After a session of oral health education, the patient returned back one more later for mucogingival surgery. The implementation of rigorous protocols, facilitated by the use of suitable tools, makes reproducibility accessible to all. Use of a dental dam and proper consideration of adhesive techniques, etching and curing time are key factors for the quality of restoration. All practitioners are familiar with the clinical protocol for the biomaterials that they use on a daily basis. It is not only important but in fact essential to carefully read the user information when making a change and testing a new product for the first time, to ensure that manufacturer guidelines are followed.

### Clinical case

An 18-year-old female patient came to the surgery for a check-up. Clinical and radiological examinations identified an active cavity in tooth 36 (fig. 1 and 2).

In order to prevent prolonged contact with oral fluids, the tooth was isolated by placing a dental dam that would remain in place until polishing the restoration (fig. 3).

Removal of the carious tissue and tooth preparation were carried out with a high-speed drill using air and water spray for vital cooling and to prevent the temperature from rising in the drilled tissues.

The tooth restoration protocol could then begin. I started with enamel etching using DentoEtch ITENA Clinical phosphoric acid for 15 seconds, followed by 15 additional seconds of dentine etching (fig. 4).

After rinsing and gentle drying to prevent increased dehydration in the dentine, the enamel appeared chalky white, a sign that the etching agent had worked correctly (fig. 5).

Iperbond Ultra adhesive ITENA Clinical (self-etching method) was applied for 20 seconds to the enamel and dentine. Then, using a micro-brush, the dentine was rubbed

for 20 additional seconds to ensure perfect absorption of the adhesive system (fig. 6).

A light jet of water was then applied for 5 seconds to spread out the adhesive, before a second application of Iperbond Ultra for 5 seconds and another jet of water for 5 seconds. After light curing for 40 seconds, the tooth surfaces appeared smooth and shiny, indicating even and homogeneous application of the adhesive system (fig. 7).

I generally use a sandwich technique by applying a fine layer of IonoCem (glass ionomer cement ITENA Clinical), followed by a flowable composite, Reflectys Flow A3 ITENA Clinical, which provides the composite restoration with a 20 to 50% reduction in contraction stress. It was then time to apply the increments of dentine mass composite: two oblique increments of Reflectys A2, in contact with the dentine, to limit contraction stress in the material and facilitate the creation of dental anatomy. Each layer added was light cured for 20 seconds (fig. 8).

A 2 mm thickness was finally left, enabling application of enamel composite Reflectys P on the surface, which was light cured for 20 seconds. To perfect the final light cure at the adhesive join, a glycerin gel was applied in order to prevent penetration of oxygen, which accelerates join erosion and unwanted colouring (fig. 9).

The dental dam was then removed in order to carry out final occlusal adjustments with Perfect Polish Flame diamond polishers (fig. 10).



- Fig. 1. Bitewing x-ray showing the cavity on tooth 36.
- Fig. 2. Situation prior to treatment. Occlusal cavity on the lower left first molar.
- Fig. 3. Total isolation through placement of a dental dam and cleaning the cavity under truncanesthesia using mepivacaine without adrenaline.
- Fig. 4. Enamel etching for 30 seconds and dentine etching for 15 seconds using DentoEtch .
- Fig. 5. Rinsing for 15 seconds and drying the cavity until the surface had a chalky white appearance.
- Fig. 6. Application of Iperbond Ultra adhesive with a micro-brush, rubbing for 20 seconds.
- Fig. 7. Smooth and shiny appearance after the second application of Iperbond Ultra for 5 seconds, a second jet of air for 5 seconds, and light curing (20 seconds + 20 seconds).
- Fig. 8. Application of Reflectys A2 dentine composite in two stages. Each layer was light cured for 20 seconds.
- Fig. 9. After applying a layer of glycerin and light curing for 20 seconds.
- Fig. 10. Final results after treatment and complete rehydration.

### Conclusion

The patient experienced no post-operative sensitivity and was delighted with the final aesthetic result. Reflectys (ITENA Clinical) composite provides the dental surgeon with an option to produce predictable aesthetic direct restorations, using a material that I found very easy to handle and polish. Just use Perfect Polish and you're done! It also has a nice transparency effect that resemble enamel.

MY  
ITENA  
CHOICE  
#aesthetic

**REFLECTYS**

UNIVERSAL RESTORATIVE COMPOSITE

Universal composite

WHY HAVE A  
SECOND VERSION  
WHEN THE FIRST ONE  
MADE THE BEST  
IMPRESSION



Since the launch of Reflectys in 2012, the formulation or the efficiency of the composite has not changed. There is no need to wait for the 10th generation product to have successful restorations!

**AVAILABLE IN TWO KITS:**

- ▶ **1. Restoration kit:** The essentials you will need for your daily restorations
- ▶ **2. Stratification kit:** For your more aesthetic or delicate restoration cases

**ITENA**<sup>®</sup>  
CLINICAL PRODUCTS

Find us on [www.itena-clinical.com](http://www.itena-clinical.com)

CE Class IIa medical device for dental treatment. For dental healthcare professional use only. Instructions for use to be read carefully before using.  
Itena Clinical 83 avenue Foch 75 116 Paris. September 2018.

Émilie BORDET  
Private practice in periodontics, former  
CTA, clinical teaching associate, Hôpital  
Charles Foix, Ivry sur Seine

## TREATMENT FOR MANDIBULAR RECESSION ON A SINGLE TOOTH

A 25-year-old female patient, in good general health and a non-smoker, presented with progressive vestibular recession of tooth 31 (fig. 1). There was inflammation in the surrounding tissue combined with the presence of plaque and tartar deposits (fig. 2). The periodontium was thin and scalloped.

After a session of oral health education, the patient returned to the surgery one month later for mucogingival surgery. Her oral health had markedly improved due to a better brushing technique (fig. 3). There were a few remaining tartar deposits (fig. 4) which were removed before beginning the procedure.

In order to use suspended sutures following the technique described by O. Zuhr and M. Hurzeler [1], composite was applied to the contact points of the mandibular incisors and canines. The first stage consisted of enamel etching (fig. 5) using 37% phosphoric acid (DentoEtch, ITENA Clinical), followed by rinsing and drying (fig. 6). In this clinical case, no adhesive was applied, so that the composite could be removed more easily when checking wound healing. The composite was applied, then light cured (fig. 7 and 8) (Reflectys, ITENA Clinical).

With anaesthesia properly administered, the surgical procedure began by preparing the receiving site using a tunnel technique, with a partial thickness incision beyond the mucogingival line of the mesial surface of tooth 33 and the mesial surface of tooth 42 (fig. 9).

Once the receiving site was prepared, the connective tissue graft was taken from the palate using the Bruno technique (single incision, full depth) then inserted and positioned in the tunnel. The graft was fixed with a flap that was itself secured coronally using the suspended sutures. Prolene 6-0 thread was used. Four suspended sutures were placed along with a fifth, periosteal suture in the apical area to stabilise the flap (fig. 10).

Wound healing inspection at one week (fig. 11) was satisfactory. The composite was removed easily using a CK6 universal curette. The coverage was not total, but the indication of surgical technique for the receiving site and the connective tissue graft type were suboptimal. Wound healing at one month showed a slight M recession (fig. 12).

### Bibliography

1. Zuhr O, Hurzeler M. Chirurgie plastique et esthétique en parodontie et implantologie - Une approche microchirurgicale. 2013. Quintessence International.

# REFLECTYS

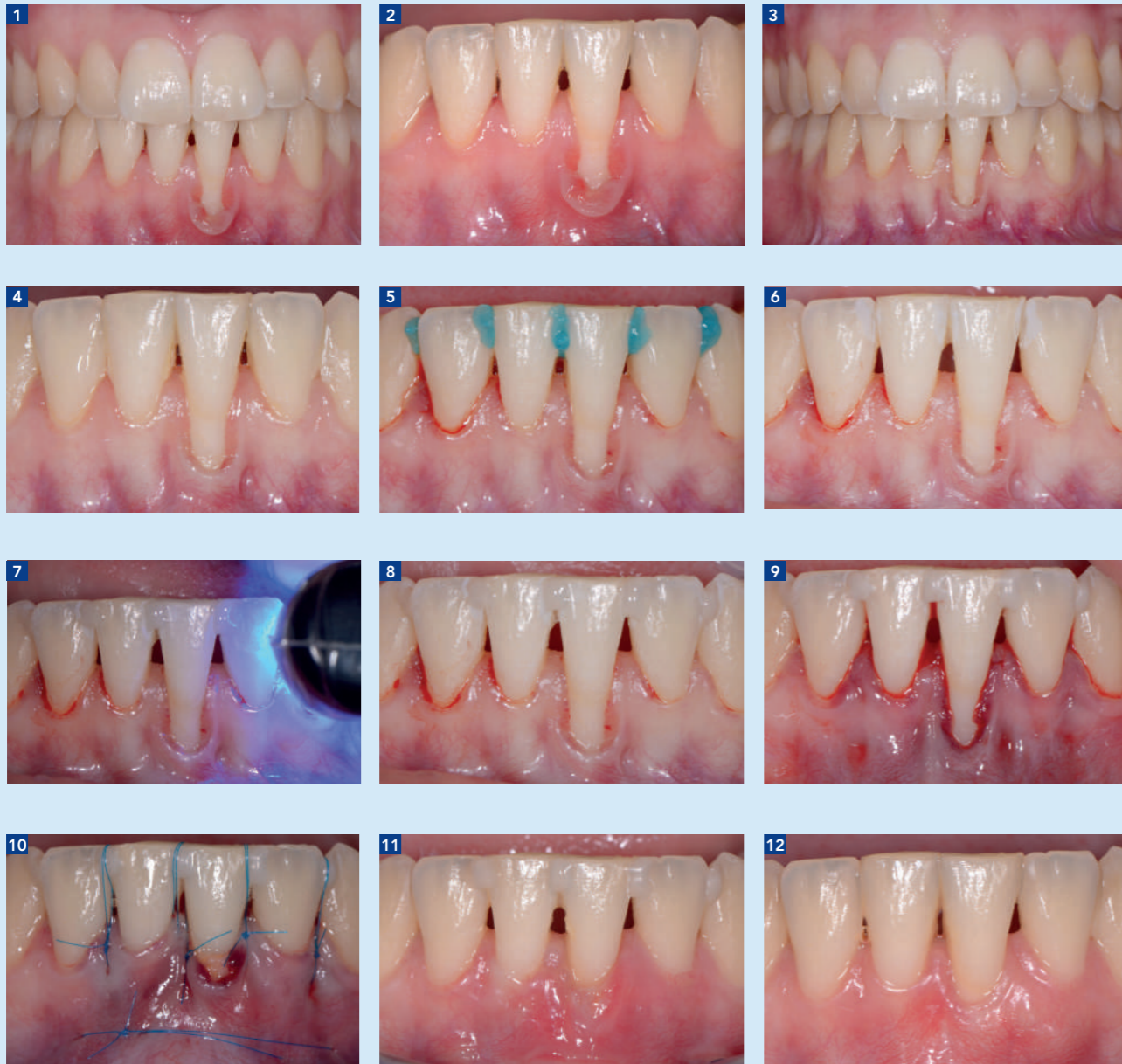
UNIVERSAL RESTORATIVE COMPOSITE

Reflectys is a light-curable universal composite ideal for anterior and posterior restorations. It is made of 20% resin matrix and 80% inorganic fillers. This blend is designed to increase the percentage of fillers and matrix properties. Its flex resistance makes it one of the most resistant products on the market. It has excellent polishing properties with a very high level of aesthetic quality. Finally, thanks to its level of tensile and compressive strength, Reflectys is the perfect solution for restorations in weakened teeth. Need to add a period at the end of this sentence

Building on 6 years of success, ITENA Clinical has redesigned its Reflectys universal composite collections to offer 2 highly practical kits:

A **restoration kit** that includes the 4 most commonly used shades, suitable for all anterior and posterior restorations. See Dr. N. Douki's article on page 16 on the benefit of using a customised shade guide.

A **layering kit for restorations** requiring an even higher level of aesthetic quality, with 7 syringes, including 3 shades ideal for layering. See Dr. Marco Morello's clinical case on page 10.





## THE ROLE OF A REFLECTYS CUSTOMIZED SHADE GUIDE IN PRODUCING A SUCCESSFUL ANTERIOR COMPOSITE

Shade selection is a daily challenge for the dental practitioner. It is an important, if not decisive, stage responsible for the final aesthetic result of a restoration. At present, we aim to follow the Vitapan Classical shade guide, which represents the gold standard, as closely as possible. In this context, our aims were:

- First, to propose a customized shade guide for the Reflectys (ITENA Clinical) collection studied;
- Second, to study the correlation between the different shades of composite resin obtained and the Vitapan Classical shade guide.

This enabled us to present the enamel-dentine combinations resulting from this correlation and thus offer combinations that any practitioner could use. To illustrate this approach, we present a clinical case with reference to the combinations of the customised Reflectys (ITENA Clinical) shade guide used.

Color selection within dental surgery is a crucial stage in producing a successful composite resin restoration. We often speak of tooth shade matching. But given the three-dimensional nature of color described by Munsell [1-3] and the various dimensions shown on the Vanini chromatic chart [4, 5], it is clear that this term is too limited to fully cover the task [6]. We should therefore speak of matching the color of a tooth rather than its shade. This stage is generally carried out using shade guides, and thus becomes "operator-dependent". In addition, the stage is influenced by the background, which is responsible for its reproducibility and translation. Further still, there is no universal agreement on standard shade matching techniques. Dental practitioners in fact refer to shade guides on a daily basis without ensuring they are familiar with the resin collection they are using. Furthermore, the tooth to be restored has two different

aspects - enamel and dentine - but the shade guide does not show the combination of the two. Most dental surgeries use the Vitapan Classical shade guide for color selection. This is the gold standard for color selection.

In this context, we experienced the following issues:

- We use the Vitapan Classical shade guide, in ceramic. The materials matched to it are not therefore of the same kind. We wanted to restore the tooth (enamel-dentine) with composite resin by matching that of the ceramics.
- Currently, there is no reliable and reproducible correlation between the Vita shade guide and the (enamel-dentine) masses used in specific composite resin collections, except for the 3M matches developed by Style Italiano, which are specific to the Z350 resin.

Table 1. Overview of the composite resin collection used

Brand	Composite resin collection: brandname	Classification	Enamel shades: 2	Dentine shades: 13	Translucent shades	Incisal shades: 1	Mass effects: 0	Total shades	Presence of a shade guide
Itena	Reflectys	Universal	E, P	A1, A2, A3, A3.5, A4, B1, B2, B3, C2, C3, D3, A20, A30	0	1	0	32	no

Table 2. Overview of enamel-dentine shades and the number of enamel-dentine combinations from the Reflectys composite resin collection

Composite resin collection	Number of enamel shades	Enamel shades	Number of dentine shades	Enamel shades	Number of enamel-dentine combinations
Reflectys	2	E, P	13	A1, A2, A3, A3.5, A4, B1, B2, B3, C2, C3, D3, A20, A30	26

Table 3. Overview of the different enamel-dentine combinations from the Reflectys collection (Itena Clinical)

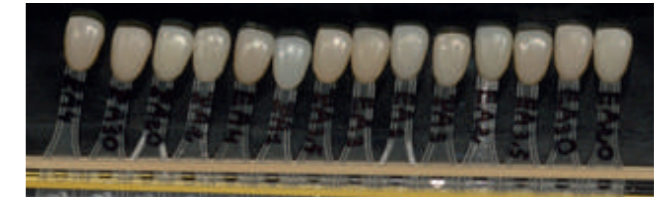
Enamel	Dentine	A1	A2	A3	A3.5	A4	A20	A30
	E	EA1	EA2	EA3	EA3.5	EA4	EA20	EA30
P	PA1	PA2	PA3	PA3.5	PA	PA20	PA30	
Number of samples								14

Understanding and better capturing color is by no means easy. How is it possible to use a simplified methodology to translate a perception of color, which is a subjective physical sensation, into reliable and reproducible scientific data? How can we make color matching a reproducible and predictable stage?

The aim of this article is to:

- Propose a customized shade guide created from different (enamel-dentine) combinations for the Reflectys composite resin collection produced by ITENA Clinical;
- Identify any correlation between this customized shade guide and the Vitapan Classical guide (tables 1 to 3, fig. 1);
- Suggest (if there is any correlation) combinations of enamel-dentine shades for the collection studied;

- Illustrate, using a clinical case, the stages of an anterior layering restoration using the combinations produced for the customized Reflectys shade guide as a basis for color selection.



1. The customized shade guide.

### Clinical case

A 27-year-old female patient, in good general health, came to us for restoration of tooth 21, which had been fractured fifteen years earlier following an accident.

First, an aesthetic treatment plan was developed. Taking an in-depth patient history enabled us to identify the nature and means of the tooth structure loss as well as the patient's aesthetic requirements (fig. 2): loss of dentine and enamel without pulp exposure in tooth 21 for the last fifteen years. No history of pain in tooth 21 was reported. Pulp vitality tests were positive, with a normal response similar to adjacent teeth. The radiological examination showed that the fracture was away from the pulp, with no signs of enlargement of the desmodontal space or periapical appearance.

Restoration of the tooth structure loss using composite resin was undertaken after confirming the initial treatment plan and motivation with the patient, who had smoked for five years (fig. 3).

Color selection is a crucial stage in producing a successful composite resin restoration [7], and constitutes the most important factor after shape [8] for the success of any restoration. This stage was achieved using the customized shade guide (fig. 1), which consisted of as many enamel-dentine combinations as possible using the Reflectys collection (Itena Clinical). Once the color was confirmed (fig. 3), the composite itself was assembled using the simple layering technique [9, 10] and using the enamel shade and dentine shade confirmed in advance, using the customized shade guide.

The Dietschi technique, simplified by Style Italiano, was used [11-16]. The special feature of this technique is the control of thickness, which is a crucial factor in the reliability and reproducibility of results [17].

Managing thickness is crucial for producing predictable, repeated, reliable and reproducible results. Once the composite was in place and the enamel composite layer had been layered and calibrated using a special tool, the restoration finishing stage was carried out using a rigorous finishing and polishing protocol to achieve biological and aesthetic integration of the restoration, thus ensuring lasting results [18-20].



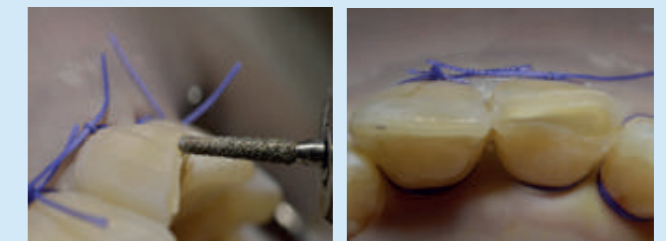
2. Pre-operative photograph: dentine and enamel fracture of the left maxillary first incisor (21) without pulp exposure.



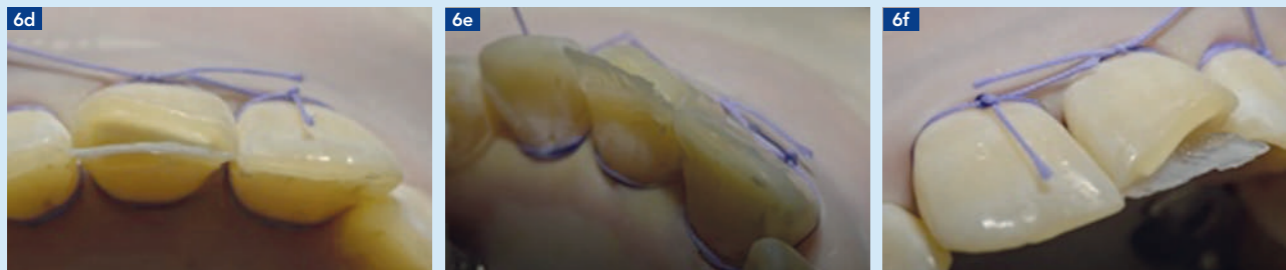
3. Color selection: the customized shade guide tabs were held against the tooth to be restored to find a match between the dental tissue to be restored and the different enamel-dentine combinations in the shade guide: a) combination A3.5 A2, b) combination A1 A3.5, c) combination A1 A4. The combination chosen was: A3.5A2



4. Implementing a waterproof operative field.



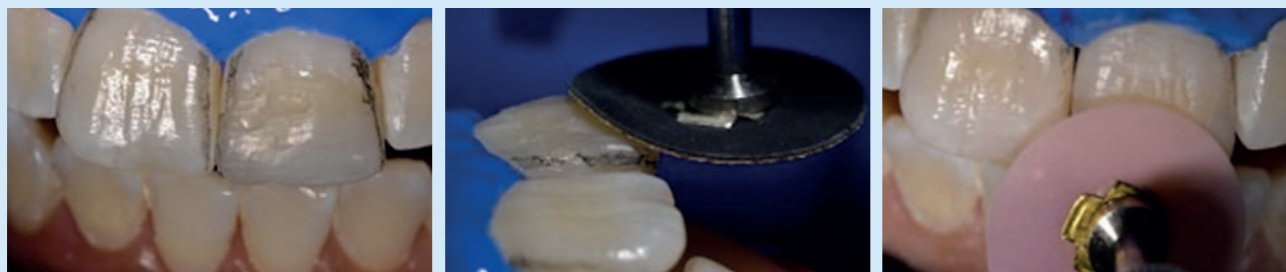
5. Preparing the tooth: chamfer along the vestibular surface (a) and palatal and proximal flattening (b).



6. Assembling the palatal wall: checking the fit of the silicone key (a), tracing the fracture line margin by scraping the silicone key with the tip of the probe (b), view of the palatal wall from three different angles (c, d, e, f).



7. Placing the proximal surface. 8. Assembling the dentine composite. 9. Applying the enamel composite.



10. Finishing the restoration with reference to the adjacent and antagonist teeth. From left to right: roughing, contouring the restoration and correcting the contour shape, tracing the transition lines, opening up the cervical embrasures.



11. Interproximal finishing of the incisal embrasures and correcting the transition and free margin angles.



12. Reproduction of the vertical texture (macrogeography) and horizontal texture (microgeography) from left to right and top to bottom: the macrot textures were highlighted using a pencil and the microtextures using articulating paper; then, they were created using 60 µm fine (red ring) or 28 µm ultra-fine (yellow ring) burs.



13. Polishing the restoration to produce a perfect surface finish: aluminium oxide-based polishing paste with two different grains using dental brushes with bristles (natural, nylon, goat hair, cotton, cashmere, chamois or woollen felt, etc.) (a), non-colored rubber cups (b).



14. Sealing the restoration with a surface resin and light curing for 40 seconds.



15. Final result: perfect imitation of the adjacent tooth.

## Discussion and conclusion

The results of this clinical case shows exact imitation and perfect harmony of the restored tooth with the adjacent tooth, demonstrating the role played by the customized shade guide for the Reflectys (ITENA Clinical) collection in a successful anterior composite.

Our analysis produced the following observations:

- Studying the various possible enamel-dentine combinations gave us a broad palette of colors within a customized shade guide. Taking into account the different colour nuances identified, we were able to work with this palette. This enabled us, first, to choose the right colors and produce aesthetic restorations that blended in perfectly and were validated in that the color selected was the color produced. Secondly, we wanted to narrow down this color palette and simplify it by identifying any correlation with the Vitapan Classical shade guide.
- We were unable to identify a match for all the shades in group A of the Vita shade guide, as the Reflectys collection correlated only to shade A1.
- Shade A1 matched PA3, EA3.5, EA4 and EA30. As the difference between PA3 and EA3.5 was not statistically significant and was clinically acceptable, dental practitioners might choose to purchase only two enamel syringes, E and P, and two dentine syringes, A3 and A3.5. If syringes are unavailable, PA3 could be replaced with: EA4 or EA30. This is also the case for EA3.5, but PA3 cannot be replaced with EA3.5. This applies only to a Vita A1 shade.

The refractive index is a very important factor. It is primarily dependent on the thickness of the vestibular enamel, which requires adjustment to regulate luminosity.

The refractive index of the Reflectys collection used was 1.58, which is reasonably close to that of enamel. For our results to be reproducible, this layer must be calibrated by 0.5 mm to match the calibration of the customized shade guide.

Finally, before using the composite resin collection, practitioners are encouraged to familiarize themselves with the shades they use by producing customized shade guides from the various masses in these collections.

However, they must also have access to a calibrator in order to check the thickness of vestibular enamel for results to be reproducible. Finally, the results presented are valid only for the Reflectys (Itena) collection and cannot be applied to other composite resins.

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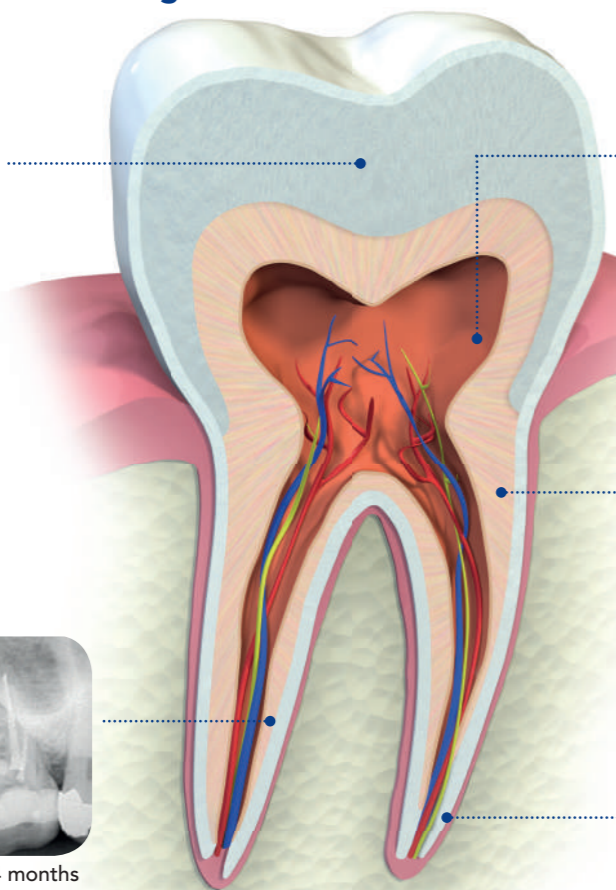
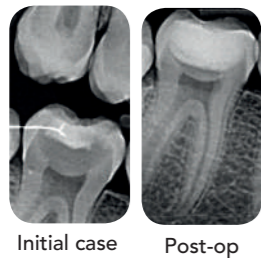
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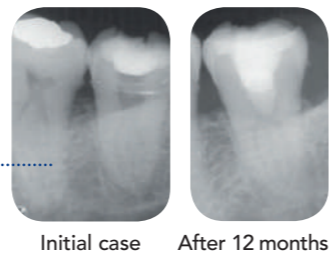
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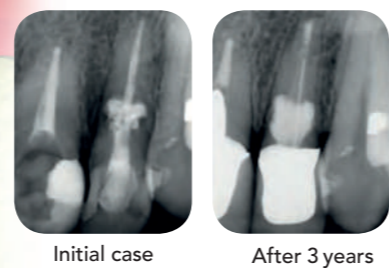
### Pulp capping on permanent teeth



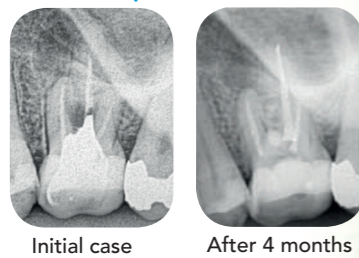
### Pulpotomy



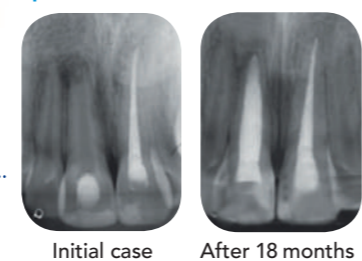
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### Root canal perforation



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