GC get connected 18

Your product and innovation update

2021

In 2021 we celebrate

“100 years of Quality in Dental”

Smile for the World

Since 1921
100 years of Quality in Dental

Contents

Dear reader,

Glad that you have decided to 'get connected' with GC once again and you are now reading our latest edition.

GC marked its 100th anniversary this year, on February 21. The origins of GC Corporation are to be found in Tokyo. This is where three young Japanese chemists laid the foundation in 1921 for what is today one of the world's largest and most successful suppliers of dental products. We are proud to share 'our' story with you in this issue.

Next to that, this issue contains several interesting cases on our newest products. Three beautiful case reports attest to the potential of G-ænial A'CHORD's simplified unishade system. Both G-ænial A'CHORD and G-CEM ONE are great examples of how you can have a reduced inventory without having to compromise on high quality.

Earlier this month, we have introduced Initial IQ ONE SQIN: with this paintable colour-and-form ceramic system, you can achieve stunning results, comparable to conventionally layered restorations but in a much quicker and easier way. You can see some fine results with these products in this magazine.

If you want to further deepen your knowledge of GC products, there's the possibility to do so via the usual channels, either in real life or online.

At the moment, we also have an exciting line-up of (recorded and live) webinars available on our educational website campus.gceurope.com. Do not forget to check out the lectures of 'the ONE symposium', which took place on May 28 in promotion of our 100th anniversary.

Enjoy reading the 18th edition of GC Get Connected!

Yours sincerely,

André Rumphorst

General Manager Marketing & Product Management
GC Europe NV

GC: 100 YEARS!

The three founders. From left to right: ***Kiyoshi Nakao, Yoshinosuke Enjo and Tokuemon Mizuno.***

3 young Japanese chemists set up GC Chemicals Research Laboratory in Ikebukuru near Tokyo in 1921. This was the forerunner of GC Corporation. Meanwhile, the company has grown into a solid multinational in the five continents. It brings about 1,200 products on the market in more than 100 countries.

The expansion of GC into Europe began 50 years ago in Belgium. Started in 1972 in Kortrijk, GC Europe is now located in beautiful buildings in Leuven, in the vicinity of KU Leuven (University of Leuven). This head office is in close contact with the university as well as with dentists, dental technicians, dealers and other dental partners.

The continuous growth of the company necessitated a coordination centre. In 2013, GC International was established in Luzern, which centrally coordinates efforts in the development and commercialisation of new products from GC Europe, GC America and GC Asia.

GC still is a family-owned business, which is tangible in the company's strong culture of transparency and trust. The company is evolving fast, but unlike in corporate companies in the business of investors there is a very strong continuity in the management. The Nakao family is in control. Mr. Makoto Nakao, grandson of one of the founders, was in charge for no less than 42 years, and he passed

the leadership to Dr Kiyotaka Nakao in 2019. The success of this family business lies in large part in the implementation of the solid Japanese wisdoms 'Semui' and the corporate value 'GC No Kokoro', whereby the community welfare must always prevail over short-term objectives.

VISON 2031

GC sets the bar very high. All GC products must be world class and a step ahead of the competition. As a manufacturer of dental products, it has received countless international mentions for its quality management. For example, GC Europe was the only dental manufacturer to become the prize winner in the EFQM Excellence Award in 2016, in 2017 it also received a Platinum Degree in the Healthcare category of the EFQM Global Excellence Index and in 2019 it received the EFQM Global Excellence Award. The long list of trophies and awards can be found at www.gceurope.com/company/gce_excellence. EFQM stands for European Foundation for Quality Management and is the most widely used organisational referention framework in Europe!

With Vision 2031, GC has a very ambitious plan: to become the leading dental company committed to realizing a healthy and long-living society. In this vision, the "leading company" encompasses more than economic growth; GC strives to bring values in dental care to realize a healthy, long-living society and as such wants to be a company that is incomparable for all stakeholders.

For the execution of this vision, all Nakamas (GC's associates) are stimulated to work together, always being customer-oriented, in each workplace and each country. GC's product arsenal covers diagnostics, prevention, restorative and prosthetic materials for all domains in dentistry and for dental technicians.

It should be mentioned that GC is the greatest expert and world leader in glass ionomers, glass hybrids and preventive products. In the field of dental adhesive technology, GC has almost a century of experience in research and production as well.

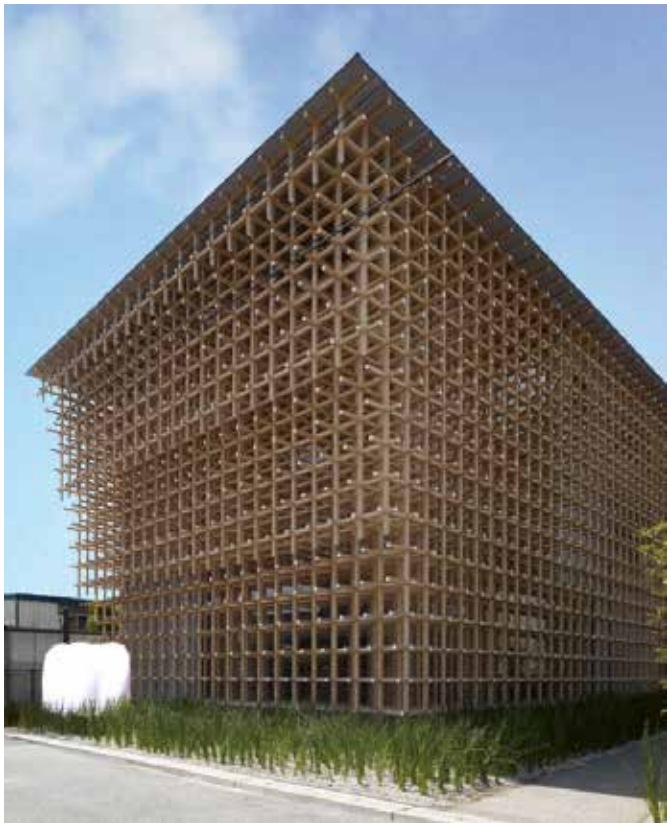
GC has always invested heavily in providing the very best in training and education to the whole dental team.

The GCE Campus in Leuven (Belgium)

At the moment there are six beautiful training facilities in Europe: Spain, Italy, Turkey, France, UK and the main training facility, one of the biggest in Europe, which opened in 2008 on the site in Leuven. The courses are primarily hands-on on the latest products and techniques in modern dentistry and are given by a specialised team of trainers and invited experts.

GC has also made the concept of 'Minimum Intervention (MI) Dentistry' the first to be truly feasible. In 2008, the MI Advisory Board was established. Together with this group of European dental experts, the MI treatment plan was developed: a concept for dentists that provides practical and patient-oriented solutions and guidelines for the minimum intervention concept.

So now we celebrate the100th anniversary. With Dr Kiyotaka Nakao as President and CEO since April 2019, GC is absolutely dynamic and remains true to its goal: all GC products must be among the absolute top and to contribute to people's oral health all over the world.



The GC Prosto Museum Research Center in Kasugai-shi (Japan) is a fine piece of architecture.

GC International AG officially appointed Dr Kiyotaka Nakao as President and Chief Executive Officer in 2019.
Left: Makoto Nakao; Right: Dr Kiyotaka Nakao.

Restoration of an endodontically treated tooth using a composite bilayer approach

By Dr. med. Dent. Katja Winner-Sowa, Germany

Dr. med. Dent. Katja Winner-Sowa *first graduated as a dental technician in 2001. Soon after, she started her dental studies and graduated in 2007 as a dentist at the Johann Wolfgang Goethe University in Frankfurt (Germany). In 2012, she finished her Habilitation degree at the University of Westphalia (Germany). She works as a dentist in Münster, where she has her own private practice since 2012. In 2013, she obtained her Master degree in Endodontics from the DGZ/APW (Akademie Praxis und Wissenschaft) in cooperation with the KZVWL (Kassenzahnärztlichen Vereinigung Westfalen-Lippe).*

Endodontically treated teeth have often suffered substantial tooth loss due to extensive caries, previous restorative treatments and the endodontic access itself. Their outcome does not depend solely on the obturation of the root canals, but also on the quality of the coronal restoration. The residual sound tooth structure that remains is of utmost importance here. Consequently, the maximum preservation and conservation of enamel, dentine and the dentinoenamel junction, not only upon restoration, but also in the long term, deserve maximal attention. In this case report, a composite bilayer approach with a short-fibre reinforced composite is described as a modern postless adhesive alternative.

After tooth 26 had undergone a root canal treatment because of irreversible pulpitis, a large and deep MO cavity was left. Even though there was considerable loss of tooth structure, the remaining walls were sufficiently thick to opt for a direct restoration. This is also the most minimally invasive approach, as no tooth substrate needs to be sacrificed to shape the cavity.

To support the remaining tooth structure and improve the durability of this restoration, a composite bilayer approach was used: the core of the restoration was filled with a flowable fibre-reinforced composite (everX Flow, GC), while at the surface, a universal composite with high wear resistance (G-ænial A'CHORD) was used.

Fig. 1: After sandblasting with alumina, clean cavity surfaces were left, ready for adhesive treatment.

Fig. 2: The enamel margins were etched for 30 seconds with phosphoric acid gel.

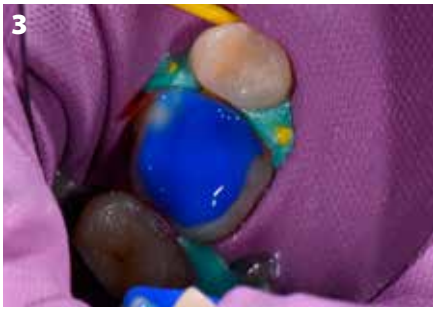


Fig. 3: The dentin was etched for 15 seconds.

Fig. 4: After application of G-Premio BOND (GC). This universal adhesive can be used in three etching modes (in this case: total etch).

Fig. 5: To strengthen the remaining tooth structure, the deepest part of the cavity was restored with everX Flow (Bulk shade).

Fig. 6-7: With a composite instrument, the matrix band was held to the adjacent tooth during curing to ensure a tight contact point.

Fig. 8: The mesial wall was built up with G-ænial A'CHORD (shade A2). This composite has a fine, silky consistence and doesn't stick to the instrument, which makes it easy to apply. G-ænial Universal Injectable (shade A2; GC) was used as a liner at bottom of the approximal box.

Fig. 9-11: Undermining cavity areas were built up with everX Flow (Dentin shade) to increase the fracture toughness. The cusps were built up one by one with G-ænial A'CHORD.

Fig. 12: Finalised restoration. Note that the enamel is still dehydrated.

Fig. 13: After occlusion check. Deflective contacts were removed.

Fig. 14: After polishing with EVE points (Comet). A remarkably high gloss could be obtained with minimal polishing and the shade blended in very well after rehydration

Conclusions

When restoring posterior cavities, it's important to assess the loss of tooth substance and to select the right materials to assure a long-lasting restoration. In large, deep posterior cavities, the load-bearing capacity can be increased by using a fibre-reinforced composite (everX Flow) in a sufficiently thick layer, covered by a conventional composite. The function of the overlying conventional composite is to give a wear-resistant surface and to provide surface gloss and aesthetics. G-ænial A'CHORD with its simplified unishade system and good handling and mechanical properties is the perfect allrounder for this purpose.

References

Lassila L, Säilynoja E, Prinssi R, Vallittu PK, Garoushi S. Bilayered composite restoration: the effect of layer thickness on fracture behavior. Biomater Investig Dent. 2020 Jun 2;7(1):80-85.
Garoushi S, Tanner J, Keulemans F, Le Bell-Rönnlöf A-M, Lassila L, Vallittu PK. Fiber Reinforcement of Endodontically Treated Teeth: What Options Do We Have? Literature Review. Eur J Prosthodont Restor Dent. 2020 May 28;28(2):54-63.

The color gradient of natural teeth and their intelligent imitation

By **MDT Stefan Roozen**, Austria

MDT Stefan Roozen *was born in Tyrol (Austria) in 1980. In 1995 he began his training as a dental technician, graduating in 1999 in Salzburg. Since then he attended numerous training courses at home and abroad. In 2001 he started at Pils Zahntechnik GmbH where he still works today as laboratory manager and deputy of the management. In 2002, he attended the master school in Baden/Vienna, where he graduated in 2003 as a master. His main areas of work are complex prosthetic reconstruction (tooth and implant supported), demanding restorations in the aesthetic and functional area. He is the author of several international publications, external speaker at the Austrian master school, speaker and co-speaker at international course and congress events focusing on fixed reconstructions, ceramics, implantology, prosthetics and CAD/CAM.*

The new GC Initial™ IQ ONE SQIN staining and micro-layering concept enables the production of natural-looking restorations with minimal use of veneering materials. Aesthetics and efficiency are combined with the complete system of new glazes and micro-layer ceramics.

The color gradient of natural teeth and their intelligent imitation

Nowadays, more and more monolithic restorations are being made. Around 90% percent of all posterior teeth are ordered in a key shade (for example: Vita A3 or A2). It is no longer necessary to laboriously layer these simple colors. For some time now, lithium disilicate and modern translucent zirconia have made it possible to make them aesthetically enough without great effort, from a single material without veneering. Just mono.
This variant can also be used successfully in the anterior area. This is particularly efficient and makes economic sense when restoring entire jaws. In case of smaller rehabilitations, however, the surrounding clinical environment requires a more individual approach and the effects of nature should be reproduced to the given extent in order to achieve good integration. Front teeth in particular are extremely multifaceted and can be very different in color and shape. From opaque to transparent, different in chroma and color value, highly dynamic and full of effects in the incisal third. Therefore, the staining technique can be combined with the newly developed SQIN - the new Initial micro-veneering type of ceramic - in order to achieve the necessary complex depth of natural teeth.

The example of nature

The essential color components of the natural tooth are hue, chroma and translucency.
- Hue: the base colors. A (red-brown), B (yellow), C (gray) and D (red-gray). (Vita classic shade guide)
- Chroma: the saturation of the respective color value.
- Translucency: in the translucent area, the light is reflected less and penetrates more through the tooth. This area is therefore also described as an absorbing zone.

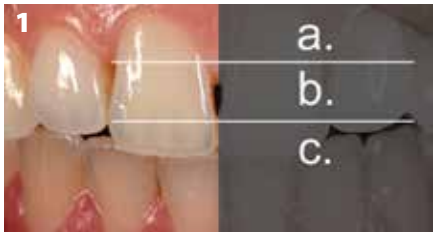


Fig. 1: The color gradient of the tooth: a) increased chroma; b) base color; c) increased translucency

The color gradient of the tooth (Fig. 1)
- The cervical 1/3: mostly with increased chroma of the base color (a)
- The central 1/3: base color, area with the highest brightness value (b)
- The incisal 1/3: area with increased translucency; absorbent area (c)

The imitation and the material

The new Lustre Pastes ONE are a further development of the proven Lustre Pastes NF. These natural looking fluorescent glazes are applied to the surface and create a three-dimensional end-result due to the special mixture of fine feldspar based glass ceramic particles. Thanks to its ceramic structure, they are suitable both as finish for monolithic indications and can be used in combination with veneering ceramics (internal and external usage).

Fig. 2: The cervical area

The cervical area (Fig. 2) usually has an increased chroma. The corresponding color tone (e.g. L-A) is applied a little more intensively in order to achieve more color saturation.

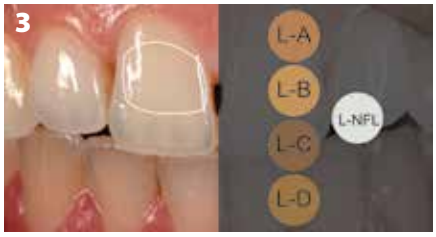


Fig. 3: The central third; (L-NFL: Neutral Fluo)

The central third (Fig. 3) is the area of the actual tooth color. The chroma is checked with L-A, L-B, L-C or L-D according to the target color. These are applied gently so that they let through. They can be used pure for a higher color saturation (e.g. A3.5, A4, B4, C4, ...) or can be softened with L -NFL to achieve a lighter shade (e.g. A1, B1, C1, ...)

Fig. 4: The incisal zone; (L-10: Twilight; L-6: Dark Blue; L-3: Dark Grey)

The incisal zone (Fig. 4) is imitated with absorbent colors. Bluish, purple and gray pastes (L-10, L-6, L-3, ...) create the illusion of transparency. Alternatively or in combination, a unique Opal paste can be applied. (L-OP).
Other effects such as white spots, cracks or the reproduction of the halo can create additional dynamism and liveliness.

Fig. 5: The halo; (L-1: Vanilla)

The halo (Fig. 5) is painted on as a bright, shining band. This shows the bundling of light on the cutting edge and enhances the transparent effect.

The monolithic implementation

Lithium disilicate and translucent zirconia are mainly used as restorative material nowadays. The fully anatomically shaped crowns are simply glazed and refined in color using the Lustre Pastes ONE.
Lustre Pastes ONE can also be combined with Initial Spectrum Stains (fine ceramic stains), thus offering unlimited color options.

Fig. 6: Before: Zr crown

Fig. 7: Application of Lustre Pastes ONE

Fig. 8: After: Finished crown

Fig. 9: Before: Zr crown

Fig. 10: After: Finished crown

When it comes to key colors, it is often sufficient to use just a few pastes. For example, with this premolar shown in Figs. 6-10, L-A (Lustre Body A) was applied in the appropriate intensity until the desired chroma of the respective A-color was achieved. L-6 (Enamel Effect Dark Blue) was used very discretely on the cusp tips to imitate some translucency. The tooth color is already visible upon the application, even before firing.
The corresponding tooth areas are color-coded for more individuality. The three-dimensional effect of the pastes creates a dynamic result (Figs. 11-12).

Fig. 11: Sintered Zr crowns after firing

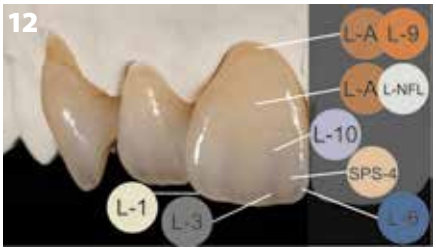


Fig. 12: Refined with Lustre Pastes ONE, after firing

The Micro-Layering Upgrade

Natural teeth can sometimes have a very complex depth and individuality in their enamel layers (Fig. 13).

Fig. 13: Grayscale image of natural teeth showing the variance in color value throughout the teeth, especially in the incisal third.

With the new micro-layering concept - Initial IQ ONE SQIN - a very thin ceramic layer (approx. 0.2-0.3 mm) is applied on the surfaces that have been previously fired with Lustre Pastes ONE. The end-result is achieved in just one firing. This is made possible thanks to the newly developed feldspar-based SQIN ceramic powders. Using the special mixing liquid (Form & Texture Liquid) the application is very comfortable – easy to form your final shape, easy to mimic texture. After the final, shiny firing result – the so called –"self-glazing effect" is obtained. Due to its high homogeneity, the mass remains very stable during processing and shows hardly any shrinkage after firing, so that shape and texture no longer need to be corrected (Figs. 14-17).

Fig. 14: Zr crown, 0.3 mm labial reduction

Fig. 15: Lustre Pastes ONE – coloring and wash fire

Fig. 16: Micro-ceramic layering with Initial SQIN

Fig. 17: Result after firing

Minimally invasive meets Minimal-Layering

With this new micro-layering concept – Initial IQ ONE SQIN - a high degree of aesthetics is achieved in the smallest of spaces. As a result, modern treatment methods that are particularly gentle on the tooth structure do not represent a compromise. Small rehabilitations in aesthetically sensitive areas can thus be carried out without great effort (Figs. 18-25).

Fig. 18-20: Initial LiSi Press (LT-B0) veneers with minimal labial reduction

Fig. 21: Lustre Pastes ONE

Fig. 22: SQIN micro-ceramic layer before firing

Fig. 23: Firing result with "self-glaze" effect of SQIN.

Fig. 24: External glaze firing with Initial Spectrum Stains

Fig. 25: Clinical outcome
(Dentist: Dr. Johannes Bantleon, Vienna, Austria)

The gingival reconstruction

Especially in implantology, we often come across the situation of reconstructing gingiva with our prosthetic superstructures. The red-white gradient deserves special attention. Here, too, the technology of Initial IQ ONE SQIN concept is used. The different gingival regions can be reproduced with three different SQIN gingival powders. A more intense red for areas with strong blood circulation and a lighter shade for the firm gingiva are essential. Furthermore, a neutral type completes the line-up. In contrary to the tooth-shaded SQIN powders, all SQIN gingival powders are inherently non-fluorescent (Fig. 30). The way it works is the same as with tooth-colored ceramics. First, Lustre Pastes ONE and/or Lustre Pastes NF Gum shades are applied to give an ideal color base and create a good bond with the ceramic layer (connection firing). Then SQIN gingiva- and tooth-colored ceramic is applied in a final firing.

Fig. 26: Zirconia structure

Fig. 27-29: Zirconia structure, application of different tooth-colored (Initial Lustre Pastes ONE) and gingiva-colored pastes (Initial Lustre Pastes NF Gum)

Fig. 30: Fluorescence of the white areas, non-fluorescence of the red areas

Fig. 31: Initial Lustre Pastes ONE after firing

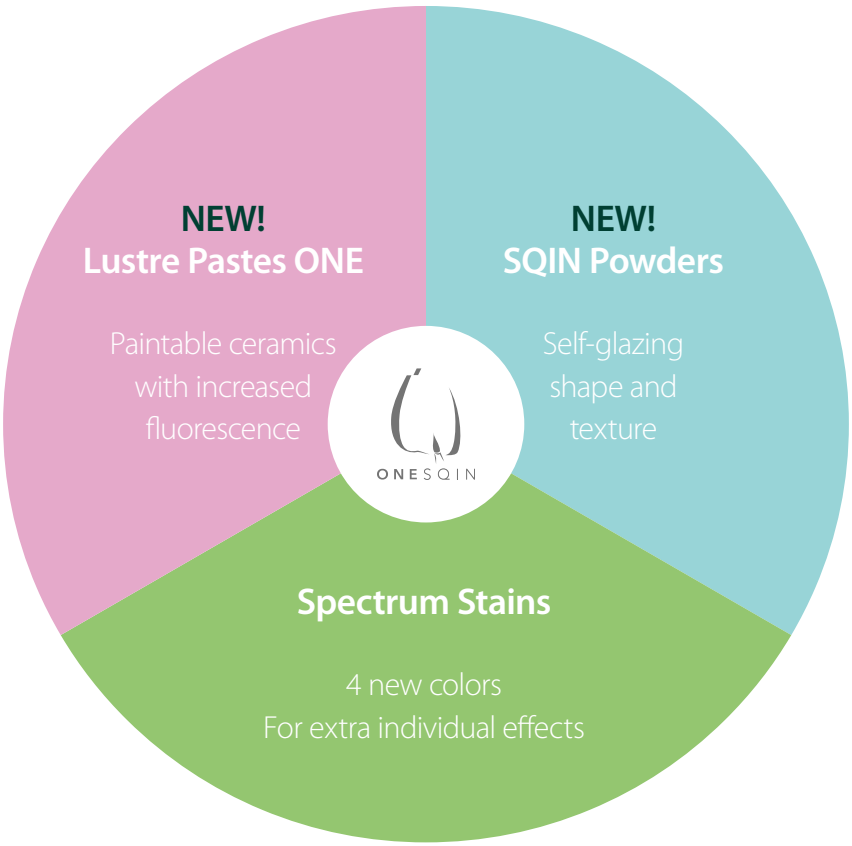
Fig. 32: Red and white SQIN ceramics before firing (shaping & texture possibilities!)

Fig. 33: Result after firing

Conclusion

The new Initial ONE SQIN micro-layering concept - offers a complete range of materials, assuring a high level of aesthetics and reduced working time. It fits to the actual full ceramic market tendency using zirconia and lithium disilicate as base materials. Using minimal veneer thicknesses minimize chipping and fractures, thus avoiding complaints. This technology is compatible with the digital workflow without compromising the individuality of the patient's wishes, and thus to be successful in the demanding dental market.

Initial ONE SQIN micro-layering concept



Evolutions in imaging with hybrid scanning

Interview with **RDT Stephen Lusty**, United Kingdom

RDT Stephen Lusty *qualified in Cape Town, South Africa. Since 2008 he has been running his laboratory in Cornwall, UK, specializing in aesthetic dentistry. His passion for the 'art of dentistry' is what drives him to continue to strive for perfection. On a normal day, Stephen works closely with his clients, seeing patients for custom shade matching and finishing.*

With your experience in digital using a variety of systems over the years, why did you choose the GC ALS2?

RDT Stephen Lusty: I had many other systems in the past which had flaws ranging from closed scan and design software to software with bugs and glitches. I had to be sure I was purchasing a unit from a reputable company.
I needed to make sure that I was buying a device from a reputable company, and that I could work with the device properly, as well as that the software that came with the scanner was as open as possible.
Hence, in 2012 I decided to purchase the original Aadva Lab Scanner. GC being a well-respected materials manufacturer and working alongside Exocad, a new software company at the time but the most open software available for design, made me feel comfortable with my choice of purchasing the Aadva lab scanner. As an extra bonus it was highly accurate for 2012, claiming an accuracy of less than 10µm. The purchase of this scanner was the point in my lab that finally made me completely comfortable with digitalizing full arch cases first in Ti and CrCo and due to the accuracy of fit even evolving to ZrO2 for certain cases.

As I mentioned, the ALS was my first introduction to the Aadva CAD SW powered by Exocad - a new player at that time but stable, easy, and intuitive to use - and design friendly! GC kept the original ALS device on the market for over 6 years, and in that time

collected user feedback to create a 'wish list' of what they deemed to be necessary to create a new even more user friendly and accurate scanner. However, when I came to the point of deciding on a future device for my lab I did not automatically go straight to GC, I tested the scanner first and created my own list of requirements for myself and my own 'wish list' to make an educated selection. As it turns out my list was easily covered by the ability and features of the ALS2 and it even has features that I did not realise that I needed until I had the opportunity to try them such as the hybrid scanning feature! The new ALS2 is an absolute work horse featuring speed, accuracy, and high definition as well as some pretty amazing additional features and it is absolutely the right choice for my lab.

What are the main benefits in your daily routine of the ALS2?

RDT Stephen Lusty: For sure, one of the main features, the accuracy of 4 µm according to ISO standards, is a big advantage for my daily work. On top of that, the speed of 22 seconds per arch is very impressive.
With this software, you experience a fully flexible scan flow generating open .STL or .PLY files.
The full articulator scan possibility, for which multiple articulator types are already included in the system, is also an asset for my daily routine.
The ability to scan an impression and the model and merge the scans accurately within the scan software, known as hybrid scanning, is also possible with the ALS2. This is the most unique feature of the device.

Could you explain to us from your perspective the hybrid scan flow?

RDT Stephen Lusty: Hybrid scanning is a unique workflow that combines an impression scan with a model scan. This allows us to work on a model without having the need to section it or ditch the dies and therefore avoids us introducing errors during scanning and keeps the true and accurate information. This workflow allows for predictable contact points, a perfect occlusion and allows us to design with the soft tissue information in place for an optimal emergence profile. All this leads to reduced work time, less model prep, less scanning and it is as predictable and accurate as the conventional flow!

Why and how is the Hybrid scan workflow bringing value to your practice?

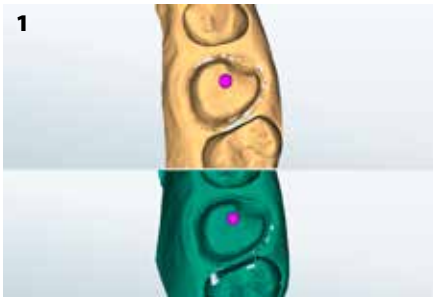
RDT Stephen Lusty: I mostly use this technique on subgingival preparations and especially on vertical (BOPT) type preparations, as there is always a high risk of destroying the impression margin when pouring these cases, rendering a second pour impossible. Hence, by scanning the impression first, I have this information saved before even casting the model. I have also used this technique to design post and cores.

How do you make use of digital techniques in your lab?

RDT Stephen Lusty: Every case I do involves some sort of digital workflow, whether it is scanned intraorally or not. The ALS2 is simply another tool and an integral part of my workflow, I always choose to have the best possible tools at my disposal as this allows me to offer the best work that I am capable of. By using a mix of digital and analogue on every case, I can create a much more predictable outcome whilst at the same time optimising the aesthetics and function through my years of hands-on experience.

The Aadva Lab Scanner 2 is a fully automated lab scanner that uses sophisticated sensor technology based on stripe-light triangulation blue-light LED.

Step by step – the use of the ALS2 in combination with Zirconia Disk.



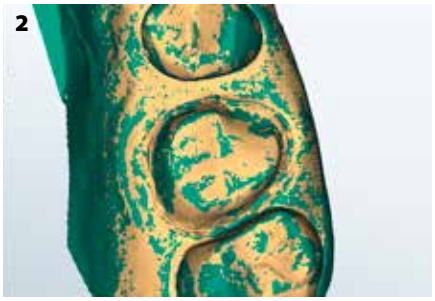
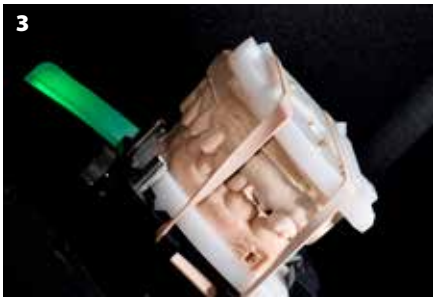


Fig. 1: A Manual double-view registration is achievable by selecting the same point on both objects to perform the alignment of impression and model scan.

Fig. 2: Visual alignment control, ensuring continuous accuracy.



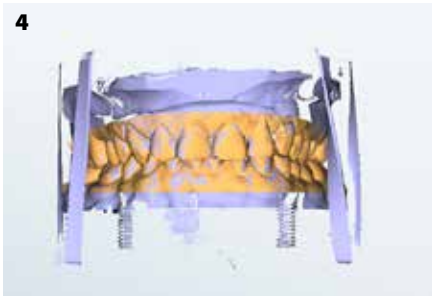


Fig. 3 & 4: Simple and reliable bite scan procedure with fully-automated software alignment.

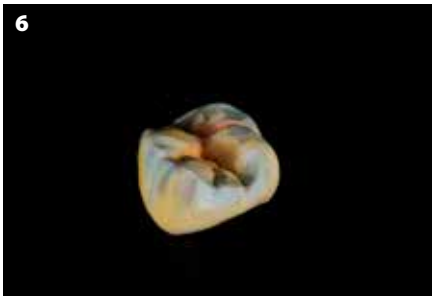


Fig. 5: Milled zirconia crown seated on the equally enlarged 3D printed model. This allows accurate controlling of the contact points and occlusion.

Fig. 6: Colouring liquids are used on the green-state zirconia just before sintering. This will give the final restoration a very lifelike effect.

Fig. 7 & 8: Zirconia restoration directly after sintering. Some additional staining with GC Initial Lustre Pastes and Spectrum stains for the final touch. Final result.

GC offers a wide portfolio of ceramic materials that fit to the different clinical and economical considerations such as cost and ease of processing.

A simplified approach to Class IV restorations using the press-mould technique

Katherine Losada, *DDS, obtained her degree in Dentistry at the Universidad Central de Venezuela (Caracas, Venezuela) in 1999 and finished a Postgraduate Program in Esthetic Dentistry at the same university in 2000. In 2012, her DDS degree was recognized in the EU/EFTA. She has been participating in dental research at Sienna University (Italy) and the department of Preventive and conservative Dentistry of Zürich University (Switzerland) where she's currently active. She is a key opinion leader and consultant for various dental companies and has collaborated on the development of dental products to improve the clinical performance. She has also given various national and international lectures and workshops and is an affiliated member of the (EAED) European Academy of Aesthetic Dentistry and an active member of the (EADD) European Academy of Digital Dentistry. She has worked in various practices in Venezuela and Switzerland, focusing mainly on digital treatment planning, including CAD/CAM, digital smile design and aesthetic and restorative dentistry. Currently, she is working in a practice in Zürich.*

By **Katherine Losada** DDS, Switzerland

Upper central incisors are the teeth that fracture most frequently in the early years of life. To restore these Class IV lesions can be stressful for the practitioner as they are in the direct view whenever the patient speaks or smiles. Any mistake in shade, shape or contour is easily noticed and may bother the patient in his daily life. Materials and methods that lead to a predictable end result are very valuable to any dentist and all the more for starting dentists.

A 32-year-old male patient came to the dental office complaining of being dissatisfied with the appearance of his upper central incisors. Both teeth were several times restored in the last 15 years due to a skateboard accident. He did not want any alterations to the shape of the teeth, but he wanted to have the colour of the restorations adjusted to his original shade (Figs. 1-2). At the moment of consultation, tooth 21 had already undergone endodontic treatment.

Teeth 11 and 21 had shade A2 as base color and were not very translucent. The core shade A2 of the G-ænial A'CHORD™ composite system (GC) had sufficient translucency for this purpose and was selected for the final layer. This universal composite with simplified unishade system and natural fluorescence excellently mimics the tooth shade and makes shade selection less complicated, even when you are using this system for the first time. To obtain a lively result, it was decided to use JE (junior enamel) and AO1 at the back portion to create a subtle gradient in the translucency (Fig. 3).

To copy the existing tooth shape, an impression was taken with a non-perforated metal tray filled with vinyl polysiloxane (EXACLEAR, GC). This material is flexible yet firm enough to use for the press-mould technique and enables visual control and light-curing through the mould due to its translucency (Fig. 4).

Fig. 1: Situation before treatment. Two old Class IV restorations were present on the upper incisors.

Fig. 2: Palatal view before treatment.

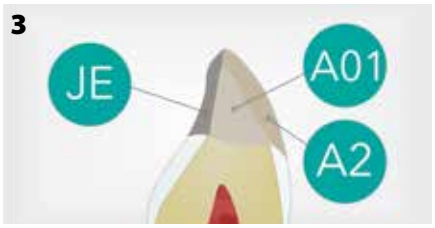


Fig. 3: The selected shades of G-ænial A'CHORD (GC) composite (JE: Junior Enamel).

A second impression was taken with a silicone putty material (Optosil comfort Putty, Kulzer) to create a firm key to shape the palatal side (Fig. 5). Instead of using the palatal portion only, a window was cut out of the key, exposing the central incisors with slight extension towards the distal sides. This way allows more support for a stable, better controlled repositioning of the silicone key in the arch.

Fig. 4: The original shape was copied with a transparent mould (EXACLEAR).

Fig. 5: Silicone putty key to create the palatal portion.

The edges of the transparent silicone as well as the putty key were trimmed ensuring that the keys were supported by teeth only after repositioning them in the mouth and could be seated correctly in the presence of a rubber dam. These pre-treatment procedures take less than 10' and ensure control over the pre-existing tooth shape.
Next, local anaesthesia was given and the tooth surfaces were cleaned to remove any remaining plaque and/or dental calculus. The teeth were isolated with rubber dam and the clamps were placed on the premolars to avoid interference with the silicone key. Both keys were tried in to check interference with the rubber dam.
Tooth 11 needed the largest restoration and was built up first. The old composite was removed, all sharp edges were rounded and a 2 mm bevel was created with a diamond bur (Fig. 6).

Fig. 6: Removal of the old composite and isolation.

Fig. 7: Silicone key in situ.

Fig. 8: After build-up of the palatal shield.

Fig. 9: Press-mould technique.

The neighbouring teeth were isolated with Teflon tape. Then, the tooth was etched with phosphoric acid gel and a universal adhesive (G-Premio BOND™, GC) was applied according to the manufacturer's instructions.
The palatal silicone key, separated with a small amount of Modeling Liquid (GC), was seated in the mouth (Fig. 7) to build up the palatal portion of the tooth in shade JE (Fig. 8).
Thereafter, because of the thickness of the build-up (approximately 1.5 mm), the core was built up with AO1 to block out the incident light in the middle of the tooth. At the incisal edge, 1 mm of JE remained uncovered so this would give some extra translucency in this region.
For the final layer, the A2 composite was preheated in order to have a smooth spreadable texture (desired for this technique) and placed into the transparent EXACLEAR mould at the vestibular side of tooth 11. Then, the mould pressed over the upper front teeth (Fig. 9). Gentle pressure was applied to avoid overfilling and the composite was light-cured through the mould. Depending on the shade, G-ænial A'CHORD can be cured in 10 (output >1200 mW/cm^2) to 20 seconds (output >700 mW/cm^2) in layers up to 2-2.5 mm. EXACLEAR has a high transparency, so curing through the mould can occur efficiently because there is little light attenuation. After removal, the restoration margins were finished to remove any possibly present overhang. The same procedure was repeated to restore tooth 21. The whole appointment including the polish time did not last longer than 90 minutes.

The patient was pleased with the immediate post-operative result; because of the fast procedure, there was little dehydration (Fig. 10). He was still pleased after one year (Fig. 11).

This case is an example of how quite large anterior build-ups can be done in a fast manner without having to compromise on the aesthetic result. Using the press mould technique and the simplified shading system of G-ænial A'CHORD is not only efficient in terms of saving time but also cost-effective. And because of the excellent colour stability and wear resistance of G-ænial A'CHORD, the patient can enjoy his restored smile for a long time.

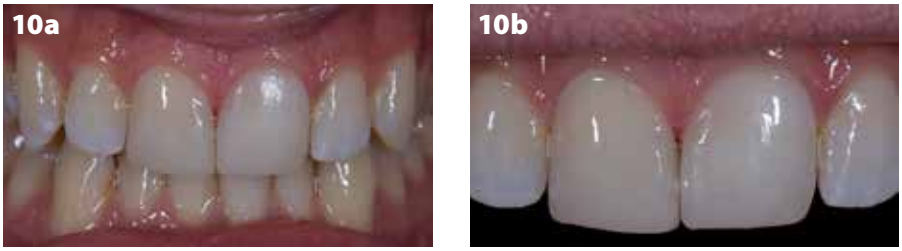


Fig. 10: Post-operative result.

Fig. 11: At follow-up after one year.

Reproduction of dentin color using Initial Spectrum Stains

By **CDT Fotis Megas**, Greece

Fotis Megas *was born in 1984 in Athens, Greece. He graduated from the School of Dental Technology of the Technological Educational Institution in 2011 and now owns his own laboratory, 'Megaslab' in the center of Athens. Fotis is specialized in aesthetic anterior restorations and collaborates with the Dental School of the National and Kapodistrian University of Athens and its postgraduate programs of Dental Prosthodontics and Dental Surgery. Fotis is an Opinion Leader for GC products in Greece for Maurice Faratzi since 2012 and Key Opinion Leader for GC Europe for Initial ceramics since 2016. He gives lectures and organizes hands-on courses all over the world as well as live patient courses in his own lab.*

Dental ceramics consist of an amorphous glass phase and a crystalline phase. The higher the glassy content, the more translucent and aesthetic the ceramic will be; however, the crystalline phase makes the ceramic stronger, but also more opaque. To improve the aesthetics, the glassy, more translucent ceramics are used as veneering ceramics and baked onto the more opaque core.

With the introduction of new classes of materials, overall properties of ceramics were improved a lot. Glass ceramics based on lithium disilicate have a high ratio of crystalline phase, but are more translucent because of the low refraction index of lithium disilicate crystals. Hence, restorations can be made of monolithic material and can be much thinner, which is a huge benefit because less tooth tissue needs to be removed, or in some cases no tissue at all.

Reproduction of dentin color using Initial Spectrum Stains

Stains can mimic vitality and pigmentation and help us to characterize the core in order to immediately obtain the shade and light refraction of natural dentin. The use of lithium disilicate material enables the dental technician to create restorations with minimal thickness, good strength and ensuring a natural appearance. The clinical case hereafter will guide you through the characterization process for monolithic restorations and restorations which require minimal translucency layers.

To achieve the desired color combination and shade, use a ceramic plate to mix different stains in different proportions. Choose your Initial Spectrum Stains powders, mix them gently with one or maximum two drops of Glaze Liquid to obtain the desired paste structure (Figures 1 and 2).

Check your mixtures by comparing them to a shade guide. Place the shade guide tab slightly angulated next to your mixtures in order to know if you need to add slightly more stain powder (Figure 3).
It's easier to choose the correct amount of stain powder for darker shades, as for the lighter shades only a minimal amount of stain powder is required.

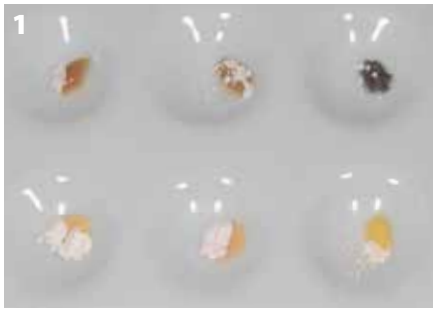


Fig. 1: GC Initial Spectrum Stains on the ceramic plate in different proportions.

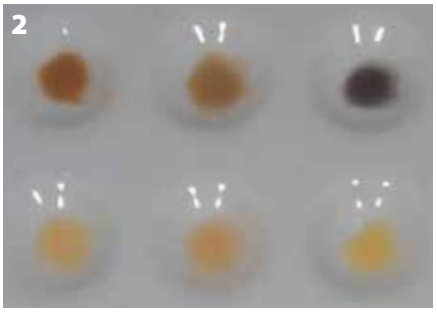


Fig. 2: GC Initials Spectrum Stains after mixing.

Fig. 3: Comparison of the mixed Initial Spectrum Stains to a shade guide.

Following tip can help you to obtain a very nice and natural result. When comparing your mixtures to the A1 V-shade, you will notice it's not easy to choose the correct mixture as they will all look darker (Figure 4a). Therefore, add some SPS-1 (Ivory White), some glaze powder and, in this case, some SPS-2 (Melon Yellow) in order to obtain the A1 V-shade (Figure 4b). By comparing the shade guide to our mixture under a slight angle, it's clear that this shade is exactly the one we want (Figure 4c).

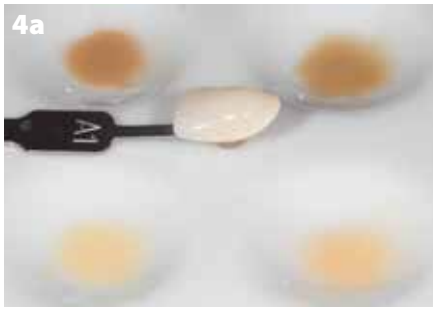


Fig. 4a: Obtaining a lighter shade is harder than a dark one.

Fig. 4b: Addition of SPS-1 (Ivory White), SPS-2 (Melon Yellow) and some glaze powder.

Fig. 4c: After addition of the lighter powders, the desired A1 V-shade is obtained.

If the core or the monolithic restoration is brighter than intended, some SPS-13 (Twilight) can be added to decrease the value (Figure 5a-d).

Fig. 5a: Compared to the shade guide, the mixture is slightly too bright.

Fig. 5b: Add some SPS-13 (Twilight)…

Figs. 5c: …to decrease the value.

Fig. 5d: The shade of the mixture matches the shade guide.

"My experience with GC Initial Spectrum Stains teaches me they are the only and best solution in case of aesthetic restorations, even in case of small spaces or discolored preparations." – Fotis Megas

How to obtain the correct dentin color on lithium disilicate.

In case of a light-colored preparation, choose an ingot with a high translucency, such as GC Initial LiSi Press MT-B1 (Figure 6a-c).

Fig. 6a: Initial LiSi Press ingot (MT-B1) after sandblasting.

Fig. 6b: Application of Glaze Liquid.

Fig. 6c: Visual control of the LiSi Press MT-B1 shade.

Application of SPS mixture without glaze powder

Fig. 7a: Application of SPS mixture.

Fig. 7b: Spread the mixture up to the middle third and pull up towards the incisal edge.

Then the chromatic Spectrum Stains mixture is applied to the lithium disilicate framework (Figure 7a-b).

Application of SPS mixture with 20% glaze powder for a softened effect

Fig. 8a: The mixture with 20% glaze powder is again applied up to the middle, this method is more similar to the way we layer ceramics.

Fig. 8b: Pull the mixture up to the incisal edge.

To create a milder and softened characterization to your substructure, you can add 20% of Glaze Powder to your Initial Spectrum Stains mixture in order to obtain a more subtle result (Figure 8a-b).

This technique allows us to cover the entire surface with sufficient powder without leaving stains or streaks.

Important note

- Leave it to dry next to the furnace before placing it on the fire tray for at least 10 minutes.
- Raise the temperature with 45°C per minute to a final temperature of 780°C and hold it for 1 minute.

How to block a discoloration using white stain (SPS-1) mixed with glaze powder

Fig. 9a: A pencil marking on the die gives an idea about the translucency.

Fig. 9b: Application of Glaze Liquid.

Fig. 9c: SPS-1 with 20% Glaze Powder.

In some cases, the underlying tooth substrate has severe discolorations that impact the final shade of the thin restoration. These discolorations can be blocked using some white stain (SPS1) mixed with glaze powder (Figures 9 and 10).

The pencil mark doesn't show through the restoration (Figure 11), which means discolored preparations can be masked.

Applying transparent glycerin – to mimic the resin cement – will help to estimate what the restoration will look like in the mouth (Figure 12a-c).

Fig. 10: Wash firing using FD-91.

Fig. 11: Fired at 780°C with vacuum.

Fig. 12a: The 'discolored' die on the stone master model.

Fig. 12b: Transparent glycerin mimics the resin cement.

Fig. 12c: The discoloration is masked.

Clinical case of an anterior lithium disilicate crown on 11

Fig. 13: Shade taking.

In this case, our goal was to use the pressed coping as a dentin structure and apply only a very thin layer of ceramic with a total thickness of 0.5 mm. We've analyzed the picture the clinician sent us (Figure 13) and tried out different mixtures of Initial Spectrum Stains on the LiSi Press coping (Figure 14). In the cervical area, it was necessary to increase the opacity and add more chroma. On the middle and incisal third of the tooth, the value had to be decreased with grey Spectrum Stains (SPS-13 and SPS-16) and small amounts of brown-orange stains (SPS-10 and SPS-4).

Fig. 14a: Two different mixes of stains SPS-4, SPS-10, SPS-13 and SPS-16 (left) and SPS-1, SPS-2 and SPS-4 (right).

Fig. 14b: A more chromatic and opaque mix is used to cover the cervical area.

After placing the fired coping on the printed, removeable die model (Figure 15), it was time to do the ceramic layering. We layer our lithium disilicate (LiSi Press) coping with Initial LiSi, which is dedicated for this type of framework.

Fig. 14c: The coping before firing.

Fig. 14d: Coping after firing.

Fig. 15: The fired coping on the model.

Fig. 16: Highly chromatic dentin mixture in the cervical area with Initial LiSi IN-42 & TN.

For the cervical area, a highly chromatic dentin mixture of 50:50 INside powder (IN-42) and Transpa Neutral (TN) was used and pulled up towards middle third of the tooth (Figure 16). This gave the restoration the warm effect of the deep dentine which can also be observed in the neighboring teeth.

Fig. 17: Mixture of equal amounts of IN-42, TN & E60.

Fig. 18: E60.

Fig. 19: Mamelon structure in FD-93.

Fig. 20: Bringing bluish-grey natural translucency on the marginal edges with EOP Booster with 5% SPS-16.

Fig. 21: Yellow-orange semi-transparency with CT-24.

Fig. 22: Palatal view.

IN-42, TN, E60 E60 FD-93 EOP Booster with 5% SPS-16 CT-24

For the middle and incisal third of the dentine part, a mixture of equal parts of Inside (IN-42), Transpa Neutral and Enamel (E60) was used. This mixture is less chromatic and was used for a smooth transition between the highly chromatic cervical part of the restoration and the more translucent incisal third. This layer slightly covered our cervical part and was pulled up towards the incisal edge. An individualized mamelon structure was taken into account (Figure 17).

The incisal edge was then completed with enamel powder (E60). As in the previous step, this layer slightly covered the dentin part to ensure a smooth transition from opacious to more translucent parts (Figure 18).

Additional incisal effects, created based upon the clinical pictures, lead to an optimized individualization of the restoration. The mamelon structure is highlighted with Fluo Dentin (FD-93) (Fig. 19).

The unique EOP Booster, in this case mixed with 5% SPS-16 (Midnight), brings blue-grey opalescence and translucency in the mesial and distal part of the restoration (Fig. 20).

Alternating opacious and translucent powders ensure a contrast of light dynamics in the incisal area and contribute to a lifelike and natural appearance.

For this case, the final anatomical shape of the incisal edge was done with CT-24. These Cervical Translucent powders are quite translucent, yet chromatic and can be used for multiple purposes: Palatinal marginal edges of incisors and canines or slightly discolored incisal edges can be built up with these powders, as well as cervical areas where more chroma is required (Figures 21-22).

After firing, shaping and contouring is performed, having token the anatomical form of tooth 21 into account (Figures 23-24).

Fig. 23: Directly after firing

Fig. 24: Shape contouring

Directly after placement, the restored tooth on 11 shows a good integration and small shrinkage.
The opacious, chromatic cervical area; the more translucent middle third and a translucent, yet chromatic incisal area, alternated by the opacious mamelon structures fits perfectly in the existing oral situation (Figures 25-26).

Fig. 25: Intraoral buccal view

Fig. 26: Intraoral lateral view

"As dental technicians we need materials that can make our daily life much easier. Initial Spectrum Stains with their fine-grained structure can easily match the color of natural dentition. The right proportion of different stains can reproduce any color we can find in the natural tooth. I am very happy to work with them in my laboratory for my posterior cases, but also for highly aesthetic anterior cases." – Fotis Megas

Acknowledgement

Special thanks to the Prosthodontist Aggeliki Labrinoudi of the Dental Excellence Clinic in Athens for the amazing clinical part and for the final intraoral photos.

Simple chords of shades for harmonious restorations

By **Dr. Wallid Boujemaa**, France

Dr. Wallid Boujemaa *graduated as a dental surgeon in 2014 from the University of Bordeaux (France). Enrolled as hospital-university assistant professor in restorative dentistry and endodontics between 2015 and 2019, Dr Boujemaa remained since then a lecturer at the University of Bordeaux. He is a full-time private practitioner and has been involved in various researches and conferences in the field of restorative and aesthetic dentistry. He is the winner of the joint Aesthetic Dentistry Contest from the French Journal "Réalités Cliniques" & GC in 2018.*

Composite restorations set the rhythm of the daily life of our dental practices. Whether they are the final goal of a rehabilitation or an intermediate stage of the treatment plan, their implementation must be easy and reproducible. In anterior areas, the shape, colour and occlusal condition must be rigorously studied to achieve the desired aesthetic and functional requirements. In terms of posterior teeth, direct restorations will have to fulfill two major goals, biological and functional. While aesthetics are not to be left behind, respect for cusp morphology will certainly be of greater importance.

For more than a decade, composite resins have been used to fulfill these specifications. Their simplicity of application, their mechanical resistance, their polishing abilities and their optical properties allow them to integrate perfectly with natural tissues over time. Among these materials, GC's G-ænial range has proven itself for 10 years. Its youngest member G-ænial A'CHORD, has just been born and seems as promising as the former version. With a smaller number of shades, it can cover the same situations as its predecessor, with a markedly improved consistency and surface condition after polishing. The two cases presented here are examples of the possible applications of this material in a successful way.

Case 1: Anterior restorations using monochromatic & multi-shade techniques

A 40-year-old patient, in good general health, attended an emergency consultation. She had fallen on her coffee table, which caused a fracture from the mesial angle up to the middle third of tooth 21. The tooth responded positively to the pulp sensitivity test. Given the colour and textural characterisations to be reproduced, a stratification session was scheduled. The patient also wanted to improve the aesthetics of her smile by having the apparent black triangles between teeth 21 and 22 reduced. An impression for wax-up and a temporary restoration using a composite in single-mass technique are carried out during the emergency consultation. Periodontal remediation and endodontic treatment of the 11, which was necrotized following the trauma, were performed prior to the composite stratification session.

Fig. 1 and 2: Initial situation.

Fig. 3: Initial retro-alveolar X-ray.

Fig. 4 and 5: Shade selection using the composite button technique, with and without polarizing filters.

Fig. 6: The wax-up allowing the creation of a palatal silicone key.

Fig. 7: Teeth isolation with a rubber dam

Fig. 8: Enamel etching using 37% orthophosphoric acid for 10 seconds.

Fig. 9: Application of G-Premio BOND universal adhesive(GC).

Fig. 10 and 11: Creation of the palatal enamel shell using the Junior Enamel shade JE (G-ænial A'CHORD, GC).

Fig. 12 and 13: Elaboration of the mesial surface with an enamel shade using a proximal matrix (LumiContrast® Polydentia).

Fig. 14: Modeling of the dentin core in opaque dentine shade AO2 (G-ænial A'CHORD GC).

Fig. 15: Modeling of dentin mamelons using the A2 shade (G-ænial A'CHORD).

Fig. 16: Application of superficial enamel, shade JE.

Fig. 17: The distal cavity is blocked with a CORE shade of medium opacity A2.

Fig. 18: Use of a impregnated with an unfilled resin (Modeling Liquid, GC) brush making it easier to sculpt and adjust the composite.

Fig. 19: Macro-anatomy management with a red flame bur.

Fig. 20: Pre-polishing with the pink silicone disc Diacomp TwistPlus® (EVE).

Fig. 21: Polishing with a beige silicone disc Diacomp TwistPlus® (EVE).

Fig. 22: Surface condition after finishing and polishing.

Fig. 23 and 24: Reduction of the black triangle with a shade of medium opacity A2.

Fig. 25: Immediate post-operative situation.

Fig. 26: Post-operative X-ray.

Fig. 27 to 32: Post-operative situation at one week.

Case 2: Posterior restoration using a cusp by cusp approach

A 15-year-old patient, in general good health, presented herself for a check-up. She reported localised sensitivity to sweet on tooth 36. The tooth responded positively to the pulp sensitivity test, and displayed an occlusal composite without morphology. Clinical and radiographic examinations revealed the presence of secondary caries under the composite, which showed micro-leakage at the margins. A session was scheduled to remove the composite and determine if a simple renewal of the composite with a direct technique was possible. At this stage, the cavity was disinfected with 2% chlorhexidine solution to reduce the bacterial load during caries removal, which could have lead to pulp exposure. After cleaning, the cavity was shaped. The pulpal wall appeared to be located away from the pulp chamber (0.5 mm). The thickness of the remaining walls enabled us to opt for a direct composite restoration.

Fig. 1: Initial situation.

Fig. 2: Pre-operative retro-alveolar X-ray.

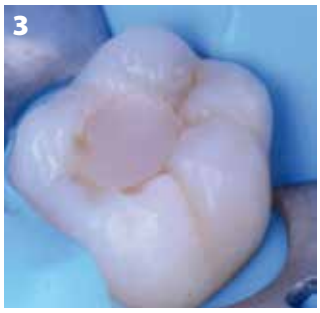


Fig. 3: Isolation of the tooth under rubber dam.

Fig. 4: Composite removal.

Fig. 5: The caries removal is carried out in a centripetal way.

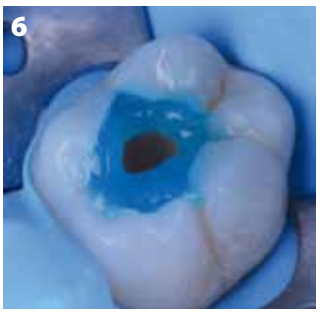


Fig. 6: Etching using 37% orthophosphoric acid for 10 seconds. This is eliminated with an abundant rinse.

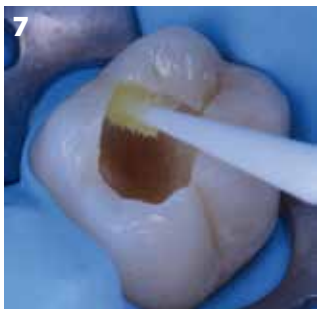


Fig. 7: Application of G-Premio BOND® (GC) universal bonding. This is applied and rubbed vigorously on dental surfaces, then dried strongly before light-curing.

Fig. 8 and 9: Application of a 2-mm composite layer on the surface of the cavity, using an injectable composite (G-ænial Universal Injectable® A2, GC).

Fig. 10-11: G-ænial A'CHORD composite® A2 (GC) is easily shaped to create the cusps.

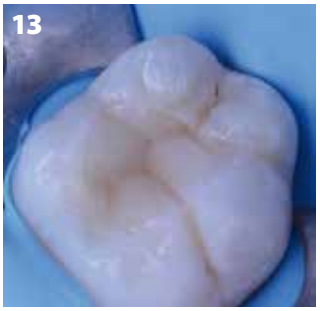


Fig. 12-13: The other cusps are built cusp-by-cusp in the same manner, creating the occlusal anatomy.

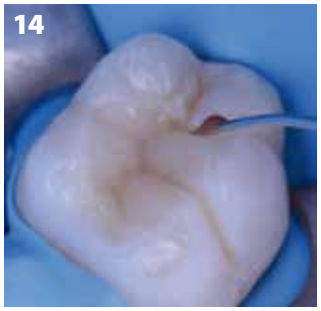


Fig. 14: The use of a composite stain (Brown Modifier®, Essentia Modifier Kit, GC) makes it possible to assess the morphology and ensure that there are no gaps.

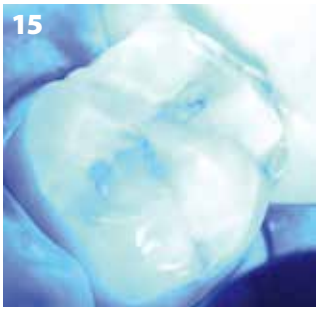


Fig. 15: 40-second photopolymerization on each side under glycerin gel (AirBarrier® GC).

Fig. 16 and 17: Polishing with silicon wheels (Soft Lex®3M).

Fig. 18: Immediate post-operative situation under rubber dam.

Fig. 19: Post-operative retro-alveolar X-ray.

Fig. 20: Immediate post-operative situation.

Fig. 21: Post-operative situation at one month. Sensitivities are gone.

Enjoy the simple things: cementation with self-adhesive resin cement

By **Dr. Christian Lampson**, Germany

None other than Albert Einstein once said: "Everything should be made as simple as possible, but not simpler." It is a mantra that is applicable to many situations, including dentistry. Bringing back the necessary work to the essentials without losing the focus on a qualitative outcome. In this article, we share some tips and tricks on how this can be applied to your cementation process on the basis of a case report.

Dr. Christian Lampson *obtained his dental degree in 2007 at the University of Heidelberg (Germany) and finished his doctorate in 2008. He is working in the Praxisklinik Dr. Dr. Thein und Kollegen in Karlsruhe since 2009. The focus of his activities is on aesthetic dentistry.*

The patient needed dental treatment after a hoof strike with trauma of the upper front teeth as a result. Tooth 21 could not be preserved; tooth 22 required endodontic treatment and a core build-up with a glass fibre post. It was planned to restore teeth 11, 12, 22 and 23 with zirconia crowns, an implant at the site of tooth 21 and a direct restoration on tooth 13.

Even though it's not the first thing that comes to mind, it is best to already select the cement during the treatment planning as well. Patient factors and the restorative design may influence the choice. Self-adhesive resin cements simplify the placement of indirect restorations by eliminating the need for separate etchants and primers. Precious time can be saved because fewer steps are required. However, as with any cement system, be sure that it's indicated in the specific case and always use it according to the manufacturer instructions to ensure optimal performance and longevity.

A long-term temporary restoration from tooth 11 to 22 was made chairside with TEMPSMART DC (GC). To optimize the alveolar bone and soft tissue prior to implant insertion, tooth 21 was orthodontically extruded before extraction. Thereafter, the implant (diameter 4.1 mm, length 14 mm) was placed according to an immediate placement protocol followed by

immediate insertion of a laboratory fabricated milled long-term temporary restoration (Shade A3). Teeth 11, 12, 22 and 23 were prepared with a circumferential chamfer and rounded edges. The implant impression was taken after 4 months of healing time while using the pick-up technique, which was applied for the exact transfer of the implant positions.

Thereafter, the placement of the definitive zirconia restorations was planned (Fig. 1).

The temporary restorations were removed and the field was isolated with cotton rolls (Fig. 2). The implant crown was placed and the screw channel was closed with universal bond and composite after having covered the screw with Teflon tape. The preparations were cleaned with a pumice slurry (Fig. 3). Thereafter, they were thoroughly rinsed and dried (Fig. 4). After the try-in, the intaglio surfaces of the zirconia crowns were ultrasonically cleaned, dried and sandblasted with Al_2O_3 to remove all contaminants. To have a good bond strength, it is important that both surfaces – the tooth abutment as well as the intaglio surface of the crown - are clean before cementation. Zirconia has phosphate-based bonding sites which attract the phospholipids in saliva and these should be removed prior to cementation. Simply rinsing off with water won't do the trick. Specific cleaning solutions could also be used.

The self-adhesive resin cement G-CEM ONE (GC; Shade A2) was used (Fig. 5) because of its excellent dark-cure properties (as zirconia does not

Fig. 1: Situation before cementation with the temporary crowns in situ.

Fig. 2: After removal of the temporary restorations.

Fig. 3: The preparations were cleaned with a pumice slurry.

Fig. 4: After cleaning, the preparations were abundantly rinsed and dried.

Fig. 5: Cementation of the crowns on teeth 22 and 23 with G-CEM ONE (GC) self-adhesive resin cement (Shade A2).

effectively penetrate the crown, this is very important), good handling and easy excess removal. It was not necessary to use the G-CEM ONE Adhesive Enhancing Primer (AEP) as the restorations were sufficiently retentive. With the tack-curing option, the excess cement reaches a rubbery consistency very fast (Fig. 6).

This rubbery stage is the best moment to remove the excess: it can be peeled off easily with a scaler (Fig. 7). The contact points were flossed to remove leftover debris and to ensure that all excess is thoroughly removed from the interproximal areas (Fig. 8). Once all debris was removed, the margins were light-cured again to reach complete setting. If needed, the margins can still be polished (Fig. 9).

Fig. 6: Tack-curing of the cement with the curing light.

Fig. 7: Excess was easily removed with a scaler.

Fig. 8: Interproximal clean-up with dental floss.

Fig. 9: Final result directly after cementation.

Fig. 10: Intraoral view at follow-up, showing lifelike aesthetics and healthy gingival aspect.

At the follow-up appointment a few months later, the gingiva showed a healthy aspect (Fig. 10).

Thinking of the appropriate steps and appropriate materials before the actual cementation is already half the work. Some steps, such as cleaning the surfaces, require extra attention to ensure good quality and to avoid problems at a later stage. In other steps, time can be saved: by selecting a self-adhesive resin cement and tack-cure before excess removal, your precious time can be efficiently spent. This is not only beneficial in terms of cost, but when the cementation can be done faster, there is also less risk of moisture in the working field.

References:

1. Evaluation of Bonding Properties of Resin Cement in Self-cure Mode. Sato K, Arita A, Kumagai T. 2019. 97th General Session & Exhibition of the IADR. 1884.
2. Influence of cleaning methods on resin bonding to saliva-contaminated zirconia. Yoshida K. J Esthet Restor Dent. 2018. PMID: 29417717

Let's get social

As part of our service to customers to keep them up to date about our products and to help them use our products in a correct way, GC has an extensive presence across the social media channels. Be sure to connect with us here:

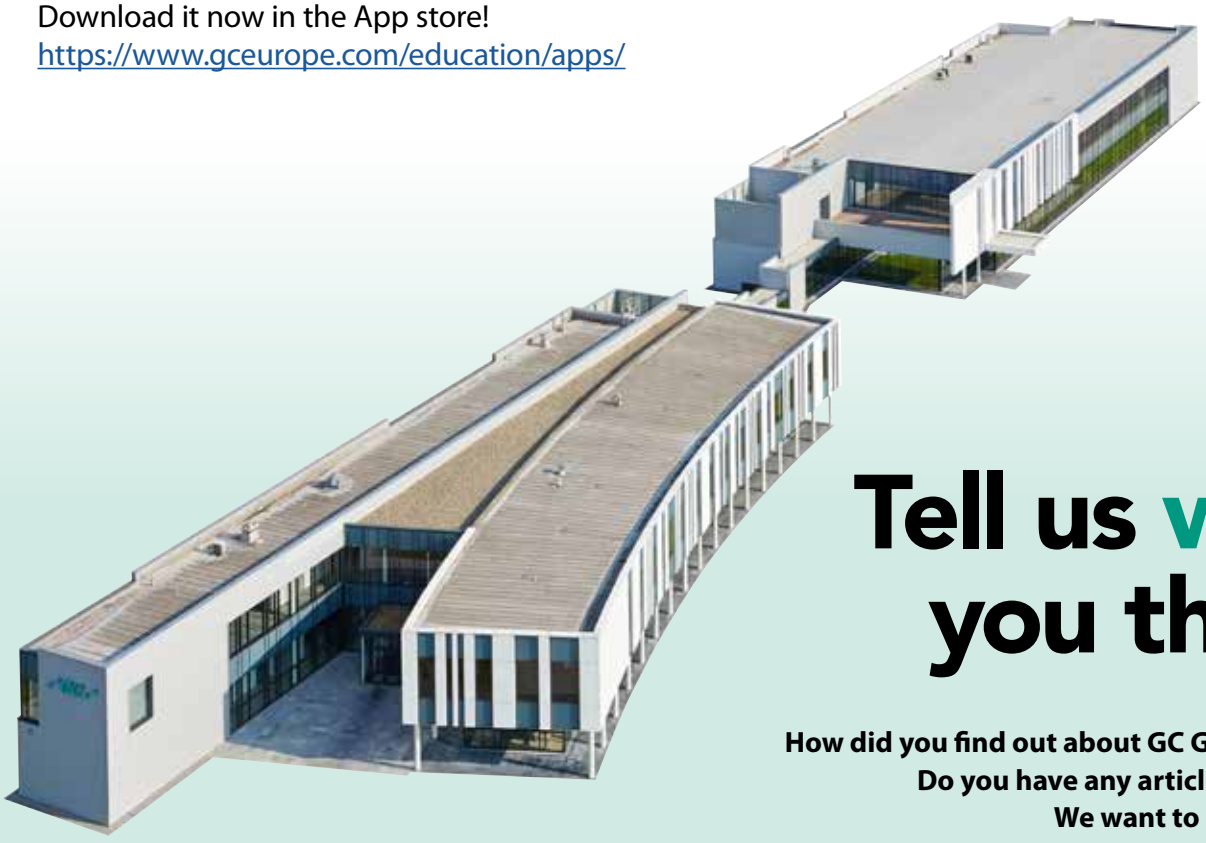
Subscribe to the GC YouTube channel

Like us on Facebook

Follow GC on LinkedIn

Follow GC on Instagram

Customer Loyalty Program Get Connected
Download it now in the App store!
https://www.gceurope.com/education/apps/



Tell us what you think!

How did you find out about GC Get Connected?
Do you have any article suggestions?
We want to hear from you!
Please send your comments and feedback to marketing.gce@gc.dental

Notes

Notes

Notes

GC EUROPE

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.gce@gc.dental
https://europe.gc.dental

GC AUSTRIA GmbH
Swiss Office
Zürichstrasse 31
CH-6004 Luzern
Tel. +41.41.520.01.78
Fax. +41.41.520.01.77
info.switzerland@gc.dental
https://europe.gc.dental/de-CH

GC AUSTRIA GmbH
Tallak 124
A-8103 Gratwein-Strassengel
Tel. +43.3124.54020
Fax. +43.3124.54020.40
info.austria@gc.dental
https://europe.gc.dental/de-AT

GC Europe NV
Benelux Sales Department
Researchpark
Haasrode-Leuven 1240
Interleuvenlaan 33
B-3001 Leuven
Tel. +32.16 74.18.60
info.benelux@gc.dental
https://europe.gc.dental/nl-NL

GC EUROPE N.V.
East European Office
Siget 19B
HR-10020 Zagreb
Tel. +385.1.46.78.474
Fax. +385.1.46.78.473
info.eeo@gc.dental
http://eeo.gceurope.com

GC FRANCE s.a.s.
8 rue Benjamin Franklin
94370 Sucy en Brie Cedex
Tél. +33.1.49.80.37.91
Fax. +33.1.45.76.32.68
info.france@gc.dental
https://europe.gc.dental/fr-FR

GC Germany GmbH
Seifgrundstraße 2
D-61348 Bad Homburg
Tel. +49.61.72.99.59.60
Fax. +49.61.72.99.59.66.6
info.germany@gc.dental
https://europe.gc.dental/de-DE

GC IBÉRICA
Dental Products, S.L.
Edificio Codesa 2
Playa de las Américas 2, 1°, Of. 4
ES-28290 Las Rozas, Madrid
Tel. +34.916.364.340
Fax. +34.916.364.341
comercial.spain@gc.dental
https://europe.gc.dental/es-ES

GC ITALIA S.r.l.
Via Calabria 1
I-20098 San Giuliano
Milanese
Tel. +39.02.98.28.20.68
Fax. +39.02.98.28.21.00
info.italy@gc.dental
https://europe.gc.dental/it-IT

GC NORDIC AB
Finnish Branch
Lemminkäisenkatu 46
FIN-20520 Turku
Tel. +358.40.900.07.57
info.finland@gc.dental
https://europe.gc.dental/fi-FI

GC NORDIC AB
Strandvägen 54
S-193 30 Sigtuna
Tel: +46 768 54 43 50
info.nordic@gc.dental
http://nordic.gceurope.com

GC Nordic Danish Branch
Scandinavian Trade Building
Gydevang 34-41
DK-3450 Allerød
Tel. +45 51 15 03 82
info.denmark@gc.dental
https://europe.gc.dental/da-DK

GC Europe N.V.
Türkiye İrtibat Ofisi
Caferağa Mah.
Albay Faik Sözdener Cad.
İffet Gülhan İş Merkezi No:9 D:4
TR-34710 Kadıköy / İstanbul
Tel. +9002165040601
info.turkey@gc.dental
https://europe.gc.dental/tr-TR

GC UNITED KINGDOM Ltd.
Coopers Court
Newport Pagnell
UK-Bucks. MK16 8JS
Tel. +44.1908.218.999
Fax. +44.1908.218.900
info.uk@gc.dental
http://uk.gceurope.com