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2022

initial™ IQ ONE SQIN

SPECIAL EDITION

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Contents

Improve your skills and discover why technicians love Initial IQ ONE SQIN so much!

This special booklet full of articles, with experts from the field, will help you to develop your skills even further.
Additionally, below videos show detailed step-by-steps and lots of tips & tricks from colleagues all over the word!

all videos

Happy reading and watching!

GC Initial IQ ONE SQIN, Painting a monolithic with Lustre Pastes ONE

GC Initial IQ ONE SQIN, Micro layering a buccally reduced anterior bridge

GC Initial IQ ONE SQIN, Micro layering a buccally reduced zirconia bridge on implants

Characterization of a posterior crown with Initial IQ ONE SQIN in a two step technique

Characterization of your anterior bridge with Initial IQ ONE SQIN in a two-step technique (young and older patient)

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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.

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.

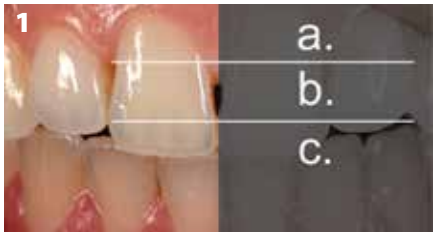


Fig. 1: The color gradient of the tooth: a) increased chroma; b) base color; c) increased translucency

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.

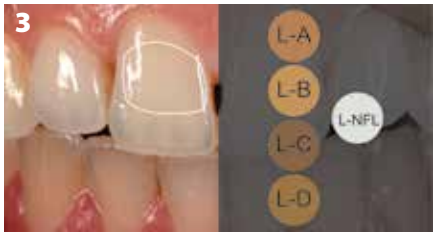


Fig. 3: The central third; (L-NFL: Neutral Fluo)

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

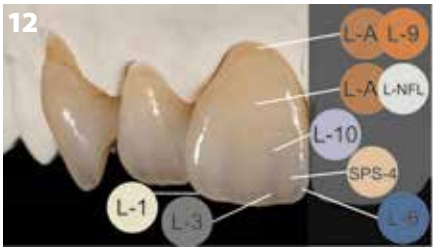


Fig. 12: Refined with Lustre Pastes ONE, after firing

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

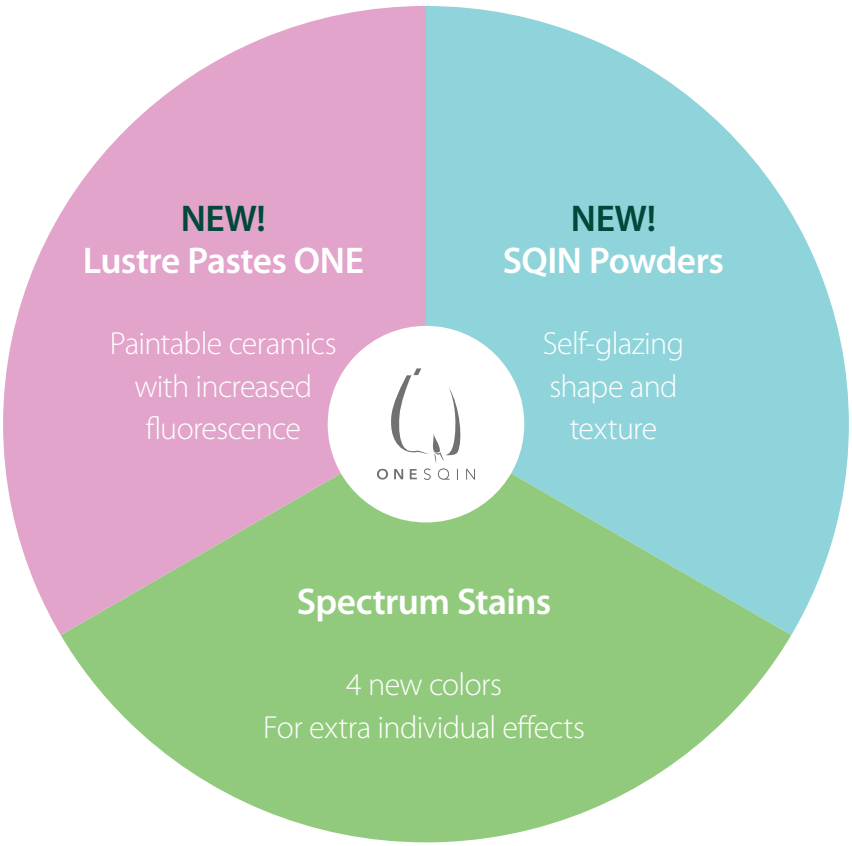
Fig. 32: Red and white SQIN ceramics before firing (shaping & texture possibilities!)

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



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Maximal aesthetics within a micro-layer!

A new, efficient concept for monolithic workpieces

By **Patric Freudenthal** IQDENT / DTG, Sweden

Patric Freudenthal *graduated as a dental technician in 1989 at the University of Malmö, Sweden. Before that he worked as a dental assistant between 1984-1986. After graduating, he worked as a technician for 10 years before starting his own lab with Björn Stoltz. IQDENT has worked with implants, CAD-CAM and aesthetics during all this time, with focus on bioinert materials. Since 2004, Patric has been lecturing on different topics, such as: implants, CAD-CAM, aesthetics, full ceramic etc. Function & aesthetics with technology is the key-instrument in his everyday work.*
He is a member (and board member) of The Dental Technicians Guild.

IQDENT

The start of all-ceramic restorations with zirconium dioxide (ZrO_2, often referred to as zirconia) was only a small change from PFM, in the sense that the coping was only in a different material. However, the digital way of working made its entry in the dental lab with CAD (computer-aided design) and that saved us some money in the production (Fig. 1). This has been important for the technique to succeed because the coping was expensive and not always the best. More detailed information can be found in my previous article about zirconia as a predicable material (Zirconia: Aesthetic, strong and predictable – first published in GC Get Connected 14, 2019).

Moment	PFM Time	Zirconia Time
Model	20	20
Spacer	3	6
Applying casting channels	2	0
Invest	2	0
Prepare alloy	5	0
Cut casting channels	3	0
Adjustments	5	0
Polishing	4	3
Margins	5	5
Wax-up	15	0
Investment material	3	0
Burn-out	4	0
Devest, sandblasting etc.	6	0
Try-in	3	1
Porcelain	40	40
Total time	**120**	**75**

Fig. 1: Production time comparison charts between the traditional PFM-crown and the first generation of zirconia

After CAD/CAM was established in the labs, a new era of ceramic materials arose to make the restorations look aesthetic and natural. In the early days before zirconia, titanium-ceramics were used, with a poor result but it was the only available option at that time. The dental industry became aware of the big market for new ceramics to layer on these full ceramic solutions (zirconia – alumina). This was the second stage of better results and better economy for the dental labs with full ceramic restorations.

When we got to full in-house production of all-ceramic work (zirconia), designing as well as milling, a door was opened to a new product portfolio.

It didn't take a long time before semi-monolithic and full monolithic crowns were implemented and designed in our lab. This product type demanded a new approach making use of ceramic staining and layering techniques.

Fast forward a couple of years and lots of experimenting. . ...

As users of GC's ceramic products, we immediately found a possibility with the Initial ceramic line and the combination of Initial Lustre Pastes NF and Initial Zr-FS (Fig. 2). This provided us two predictable products: monolithic crowns using a ceramic painting technique and semi-monolithic (designed for micro-layering ceramics) crowns.

Along the way, we learned a few things:

- We saved time leading, to increased profit
- The shape and size were already in place (CAD design)
- The amount of different materials used decreased
- We didn't lose our goal of delivering esthetic results

This procedure and material selection became our standard protocol for all-ceramic solutions, both for zirconia and Initial LiSi Press (lithium disilicate pressable ceramic). With this standardised workflow, everything became more efficient and controlled. This set-up could be perceived by our customers in terms of positive feedback, in our turnover and profit and in the amount of time spent in the lab – everything became better.

As business owners, we always look at our costs, production time and the effect on our profit, while maintaining the quality requirements.

Still we were not satisfied with this set-up. In my entire career, I've always searched for ways to improve whatever I'm doing and my business partner and I have made some good choices over the years (but also a few bad ones).

This has led us to our current situation. Our dental lab - IQDENT - is today a 98% digital lab. Our products are 90% all-ceramic and our standard products are monolithic and micro-layered crowns, bridges and implant work. We recently also engaged into digital dentures, partial dentures and splints. If we get requests for traditional PFM, we take care of the design but outsource the production (milling or metal sintering).

This way of thinking and running our business also lead us to experimenting with the available solutions. So we combined Initial Lustre Pastes NF with a little bit of Initial Spectrum Stains and Initial Zr-FS to get a more effective way for micro-layering without compromising on the aesthetics.

At the same time, GC was looking into novel ceramic solutions that lead to a new concept that fitted into their Initial IQ philosophy – "Intelligent Quintessence - with less you do more ...." and was launched as "the Initial IQ ONE SQIN concept".

Fig. 2: Case with a foundation of Initial Lustre Pastes NF, sprinkled with Initial Zr-FS "CL-F", then individualised with Initial Spectrum Stains and finalised with Initial Zr-FS (Enamel and CT).

It is all about material improvements based upon new Lustre Pastes with increased fluorescent character (Initial Lustre Pastes ONE – LP ONE) and new powder technology for micro-layering techniques (Initial SQIN), both compatible with the Initial Spectrum Stains (SPS). During the field tests performed in our lab, we could already notice the possibilities and potential of this concept. Now, after a few months into the evaluation phase, we have a solid system at our disposal for all-ceramic works:

- Even more time saving
- Predictable results
- High quality output

When our "old way" using a protocol Initial Lustre Paste NF and Initial Zr-FS is compared to this new Initial IQ ONE SQIN concept, it can be seen that the protocol remains more or less the same, but a few steps and firing cycles could be removed (Fig. 3).

Moment	Initial Lustre Pastes + Initial Zr-FS	Initial Lustre Pastes ONE + SQIN
	Time	Time
Processing	10	10
Printed model	0	0
Prepare margins	15	15
CAD/CAM	1	1
Cut out of blanks	10	10
Prepare coping	5	5
Coloring Liquids (unsintered)	5	5
Initial Lustre Pastes (sintered)	25	15
Ceramic layering	0	0
Finishing & polishing	10	10
Total time	**71**	**61**

Fig. 3: The left chart shows the "old" way and the right chart is with GC Initial IQ- ONE SQIN concept. Ten minutes are saved on every single unit.

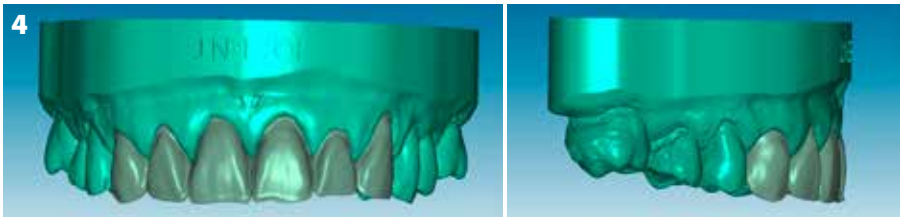

Fig. 4: Digital design of the framework with a 0.2-0.4 mm buccal cut back

The GC Initial IQ ONE SQIN concept in our lab

Step-by-step preparations:

- Digital design is with a buccal cut-back between 0.2-0.4 (Fig. 4)
- Mill wax (or print) in case LiSi Press is used or mill the zirconia
- Press or sinter in the desired base color
- Prepare the framework for ceramic layering as usual
- Sandblast the framework slightly with 2.0 bar pressure (pure Al_2O_3)

Step-by-step ceramics application:

- Application of the ready-to-use new LP ONE to cover the complete framework/coping. SPS are used for details (when required).
- Firing is done with vacuum following the instructions. The new LP ONE offer colour as well as fluorescence and serve as connection layer (Fig. 5).

Fig. 5: The lithium disilicate framework (Initial LiSi Press LT), individualised with Initial Lustre Pastes ONE.

- When the colour and characterization are adequate, the new Initial SQIN ceramics are applied. It is important to use the dedicated "Form & Texture" liquid and the correct drying time. If the ceramic layer is thicker, the drying time needs to be longer.
As a glaze fire we use the dentin program but take it down to 710°C (can be different in different ovens). Even though we could significantly reduce our working time, the finished restorations look beautiful and lifelike (Fig. 6).

Fig. 6: Finished full ceramic restoration with SQIN. Vestibular and lateral views.

Some clinical cases with zirconia: step by step

Besides its use onto lithium disilicate frameworks, Initial SQIN can also be used to microlayer zirconia frameworks as can be seen in the next cases. LP ONE are again ideal to characterise the framework and to serve as a connection layer for the SQIN ceramics.

Before the digital buccal reduction (Fig. 7), a digital wax-up was made and the dentist had a try-in. If there are any adjustments needed, the dentist rescans and sends the file to the lab before the final design is milled.

Fig. 7: The digital cut back is only 0.3mm

After the milled workpieces are fitted on the model, they are slightly sandblasted (2 bar). After a first characterisation firing with LP ONE and SPS, the micro-layering is done using Initial IQ SQIN (Fig. 8). To fix the zirconia restoration onto the trays in the furnace, we use Initial Firing Foam.

Fig. 8: The zirconia restorations are characterised with LP ONE and SPS and layered with Initial SQIN.

After fitting, surface and texture shaping of the restoration, we glaze at approx. 720°C or polish (Fig. 9).

Another major advantage of this concept is its repeatability and predictability for any kind of all-ceramic case (Fig. 10) as can be seen in the next case with gums.

Even restorations with gingival reproduction follow the same easy approach: design, mill, sintering, LP ONE characterisation and SQIN micro-layering and texture.

Usually we don't use any infiltration liquids to colour the gingival part of the zirconia. We start from a tooth-colored framework (Fig. 11) and then layer gingiva ceramics over it (Fig. 12). This approach follows the same procedure as previously explained: slighty sandblasting the framework, a first layer of Initial Lustre Pastes NF GUM shades (with Initial Spectrum Stains). Detailed gingival morphology is given with the Initial SQIN Gum shades (Fig. 13).

At IQDENT, this is just one of our tools when it comes to ceramic restorations, because we use the complete GC Initial system. For particular, complex cases where more details, depth and incisal translucency are needed, Initial Zr-FS or Initial LiSi are used. For all our standard cases (some of which are also more complex), we go for the Initial IQ ONE SQIN concept, whether it is a single crown, implant work or bridge, zirconia or Initial LiSi Press. In other words: it is a very versatile system.

Fig. 9 a-b: Final restorations after glazing. a) on the model; b) in the mouth

Fig.10: Green state zirconia, before sintering. Thanks to the digitalization, any case is now reproduceable.

Fig. 11: An 8-unit restoration with gingival reproduction

Fig. 12: Gingival layering on top of the zirconia framework.

Fig. 13: Final restoration after firing. The auto-glaze effect of the SQIN ceramic is clearly visible.

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Excellent aesthetics with a significant time gain

MDT Michael Brüsch, *Düsseldorf, Germany*
MDT Michael Brüsch is an authority on the subject of all-ceramic and biomaterials and functional restoration work. He is an international adviser and course presenter. Brüsch' has a great contribution in the development of the GC Initial ceramic line.

Diederik Hellingh, *Business Unit Manager Prosthetics, GC Europe*

RDT Mark Bladen, *Worcester, United Kingdom*
Master Ceramist and lab owner for 35 years. Mark is a GC KOL since 2005 and has been presenting various courses throughout Europe on layering, micro-layering and stain-and-glaze techniques.

Interview with **Michael Brüsch, Mark Bladen, Leonardo Cavallo, Carsten Fischer, Patrick Freudenthal, Joaquin Garcia Arranz, Diederik Hellingh** and **Stefan Roozen**

GC Initial™, the well-known dental ceramic system accelerates the laboratory workflow with a new and highly aesthetic, paintable colour-and-form ceramic system: GC Initial ONE SQIN. On the occasion of its introduction, we had a coronaproof (!) interview with various experts in the field.

With the ONE SQIN paintable colour-and-form ceramic concept a highly aesthetic result is easily achieved in only two firings.

CDT Carsten Fischer, *Frankfurt am Main, Germany*
CDT Fischer owns a specialist dental laboratory in Frankfurt am Main and acts as an international consultant and his many publications bolster this role. The main focuses of his work include CAD/CAM technologies, ceramic double crowns, pressable ceramics and individual abutments.

MDT Patric Freudenthal, *Ystad, Sweden*
Since 2004, Patric has lectured on different topics, such as: implants CAD/CAM, aesthetics, full ceramics, etc. Function & aesthetics with technology is the key-instrument in his everyday work.

MDT Joaquin García Arranz, *Madrid, Spain*
Joaquin García Arranz (Quini) is a speaker of numerous courses in national and international conferences and author of different articles published in national magazines and author of the book "Experience Group".

Why has GC developed the GC Initial IQ ONE SQIN concept and what does that actually mean?

Michael Brüsch: This novel concept has been developed to be able to follow the current market demands and it opens up a different and unique way of micro-layering.

Diederik Hellingh: While the entire manufacturing process is becoming more digitalized, customers are having increased aesthetic expectations. The pressure on the laboratories is high to work cost-efficient while delivering excellent quality. GC Initial ONE SQIN is the response to these demands. Highly aesthetic restorations for the anterior as well as the posterior area can be made without needing cumbersome and time-consuming layering techniques.
The system is based on the GC Initial "IQ philosophy" and consists of perfectly compatible, different ceramic materials to realize an efficient, beautiful finishing of pure monolithic and buccally reduced restorations. The work procedure is very short but enables the dental technician nonetheless to choose his preferred technique.
Used on full monolithics, the new Lustre Pastes ONE - feldspar-based 3D paint-on ceramics - add colour, depth and lifelike translucency with a very natural glaze. Their inherent fluorescence is intended to fine-tune and boost the overall fluorescence of monolithic restorations.

The new Lustre Pastes ONE with inherent fluorescence

Excellent aesthetics with a significant time gain

On buccally reduced monolithics, these Lustre Pastes ONE are used to characterize and add colour and also serve as connection firing before application of the new SQIN ceramics. The latter are easily applied in a thin layer of about 0.1–0.6 mm over the painted and fired Lustre Pastes ONE surface. Thanks to the refined mixture of feldspar-based glasses, a lifelike 3D-effect is created, not shy of any comparison to conventional layering. Their unique application and modelling properties will facilitate individual surface texturing and it has self-glazing properties so finishing can be reduced to the minimum.

With the ONE SQIN concept, a new era of ceramic layering has begun

The GC Initial product portfolio already comprises a full line-up. Why would it still be interesting to have this GC Initial IQ ONE SQIN concept in the lab?

Carsten Fischer: Because of big improvements in monolithic frameworks, the indication areas with regard to micro-layering have increased: micro-layering is now also used aesthetically in the anterior area and it is no longer possible to imagine the digital manufacturing process without it. A system like Initial IQ ONE SQIN is absolutely necessary in order to meet all the requirements of today's modern dental technology in a dental laboratory.

Mark Bladen: Exactly. The ONE SQIN concept is meeting the requirements for microlayering of zirconia and lithium disilicate, but also brings the results to another level.

Joaquin Garcia Arranz: The new Lustre Pastes ONE provide the fluorescence that is needed on monolithic frameworks like zirconia and lithium disilicate. Combine them with the SQIN ceramics and you can achieve stunning results.

Mark Bladen: And on top of that, it makes your work easier and predictable.

And what if you have never used GC Initial before? Can you still step into this new concept?

Mark Bladen: In my opinion all ceramists will be interested in the ONE SQIN system as financial demands require labs to be more efficient – faster but meeting high aesthetic demands every time. I know of many labs who would be very interested in trying this system.

Carsten Fischer: Everyone could benefit from it! It is certainly interesting for young dental technicians who want to achieve an aesthetically predictable result without great effort or to attend several courses. But also advanced dental technicians will appreciate the ultrafine grain of the powder, good fluorescence, excellent light-optical properties in the mouth and state-of-the-art technology.
It is suitable for any laboratory that want to get into micro-layering and painting technology.

Diederik Hellingh: You do not need to be familiar with the Initial ceramic as the technique is very straightforward and predictable. From that perspective, it reminds the popular 'Paint by number' that most of us will know from our childhood: 'Make a beautiful painting the first time you try'. IQ ONE SQIN is exactly like that.

MDT Stefan Roozen, *Zell am See, Austria*
MDT Roozen focuses in his work on the complex prosthetic reconstructions (both tooth and implant supported) and demanding restorations in the aesthetic and functional area. He is the author of several international publications, speaker at the Austrian Master school and speaker at international courses and congresses.

MDT Leonardo Cavallo, *Sicily, Italy*
Leonardo Cavallo runs a dental laboratory in Messina, Sicily where he focuses on aesthetic dentistry and implant supported restorations. His goal is to emulate the natural beauty of natural teeth.

What makes the synergy between the Lustre Pastes ONE, SQIN ceramics and Spectrum Stains unique in this concept?

Joaquin Garcia Arranz: It is a fully comprehensive concept that fits today's trend of monolitic full ceramic restorations.

Carsten Fischer: The concept is well-coordinated and in its total provides very aesthetic results. And that without extreme effort!

Michael Brüsch: All components are simply optimally adjusted to each other. There is no comparative or better material with these excellent characteristics available on the market at the moment.

GC always develops products with the users' needs in mind. What about GC Initial IQ ONE SQIN? What is the added value here?

Leonardo Cavallo: The ceramic is very dense and is easier to manage and to work with.

The material contracts less during firing and this makes it possible to work much faster. It adds fluorescence to zirconia and lithium disilicate monolithics, which is necessary to copy natural teeth.

Carsten Fischer: The colour accuracy and reproduction of V-shades are absolutely predictable with the use of the IQ ONE SQIN concept. When you apply the colours to the surface, you can see that they fit - you can really see what you get. The colours are very warm and with the correct firing, an extremely homogeneous result is obtained.

Mark Bladen: I also really like the special modeling liquid. It gives a high degree of control to shape and even build natural surface characterizations that remain after firing in the super-dense and qualitative ceramic surface, which – on top of that - is auto-glazed.

Stefan Roozen: The work process has been made so much faster and easier. Because of the low shrinkage and shiny effect after firing, corrections are hardly necessary.

Excellent aesthetics with a significant time gain

Surface texture can be easily adjusted with Initial IQ SQIN

Carsten Fischer: Compared to other systems, it is the most modern material science concept on the market. You do not have to learn a new technique (such as with competitive products) but can stay in your proven ceramic layering technique with the SQIN powders.

Patric Freudenthal: I really like that the surface texture can be adjusted so easily. I especially like it for single crowns; it is faster and much easier to control.

Michael Brüsch: And for large bridge constructions, it is particularly interesting that you can achieve this level of aesthetics with a minimal layer thickness.

Which three reasons would you state to convince your technician colleagues to step into this new GC Initial IQ ONE SQIN concept?

Joaquin Garcia Arranz: One, it is faster. Two, it is easier. And three, it's more stable.

Patric Freudenthal: I would say "less is more"; less products but more or less the same result.
On top of that, it is an easy-to-use and a very logic system.

Mark Bladen: I second that! It is easy to use and understand and the compact kit contains all that's needed to reproduce any shade or features needed to copy every dentition. The results are better than with any other system on the market.

Carsten Fischer: First: time saving! Next to that, the predictability of results, including the colour, warmth, light dynamics and aesthetics. Last but not least, the functional properties: it renders homogeneous surfaces that are clearly more antagonist-friendly. In my opinion, no other manufacturer on the market can offer this quality of surfaces at the moment. A perfect development by Michael Brüsch and the GCE & Klema team. TOP!

One system for multiple indications

A paintable colour-and-form ceramic system for lithium disilicates

Our lithium disilicate solutions - for either pressable or computer-aided manufacturing - render the most optimal physical and aesthetic properties

Initial LiSi Press
Pressable glass ceramic ingots

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How does it work? You choose... What you paint is what you get!

Bucally reduced (0.3 mm) framework
(Zr or lithium disilicate)

Lustre Pastes ONE
Application & firing
Colour & fluorescence

SQIN
Application & firing
Form, texture & gloss

READY!

Monolithic framework
(Zr or lithium disilicate)

Lustre Pastes ONE
Application & firing
Colour & fluorescence

READY!

ONESQIN

initial™ IQ ONE SQIN

The Mini-Max principle: When profitability is combined with aesthetics

GC Initial™ IQ ONE SQIN painting and micro-layering system: A new level in the field of all-ceramics

*MDT **Andreas Pilch** received his dental technician training at the Senteder Dental Laboratory in Reinberg (Germany) from 2002 to 2005. Since then, he has worked in several laboratories in Germany. From 2012 to 2016, he attended the Master School in Düsseldorf, where he graduated first of his class. Since 1018, he is working at Manfred Hetjens Dental-¬¬Labor in Geldern (Germany)*

By MDT Andreas Pilch, Germany

The goal of all-ceramic restorations is to produce a natural imitation of beautiful teeth. At the same time, dental technicians must meet the economic challenges facing the dental laboratory. A balancing act that can be mastered nowadays with modern ceramics and dental finesse. The author describes his work with the GC Initial™ IQ ONE SQIN painting and micro-layering ceramic system. As a result, the mini-max principle can be implemented in the laboratory day and achieves maximum aesthetics with reduced effort.

Observe, create, set up, try out... the path to skill is long for dental technicians and it is characterized by patience and perseverance. Especially in the production of ceramic restorations, countless small subtleties determine the result. The shape, colour and texture of the restoration, functional parameters, framework materials, shrinkage properties of the ceramics – all this must be mastered. The aim is to deliver a restoration with a natural and aesthetic overall look. Impressive here is the fact how intensively dental technology has been dealing with the imitation of natural teeth for decades. Ceramic veneering techniques that have matured almost to perfection enable maximum aesthetics. Nevertheless, costs and efforts are high up to the maximum achievable outcome. In order to meet the economic requirements of the day-to-day laboratory routine, concepts and materials (i.e. lithium disilicate and zirconium oxide) have been developed with which monolithic restorations can be produced. However, the benchmark for the aesthetic result – especially in the anterior region – is the traditional layered crown. A modern, alternative production route for all-ceramic restorations is micro-layering.

The Mini-Max principle in all-ceramics

With as little use of resources as possible, the defined goal should be achieved – this is how the "Mini-Max principle" can be explained in one sentence. Translated to dental technology, this means accomplishing the maximum achievable result with the most manageable effort. While, for example, for posterior crowns, the path with minimal effort is the full monolithics implementation, this system often reaches its aesthetic limits in the anterior tooth area. The alternative is micro-layering. In this process method, the fully anatomical ceramic framework (pressed, ground or milled) is slightly reduced at the vestibular side and at the end, the light-optical properties of the natural teeth are imitated by means of a thin layer of veneering ceramics. The process can be wonderfully combined with the painting technique to achieve the last bit of naturalness. The GC Initial™ IQ ONE SQIN painting and micro-layering concept stands for a well thought-out system with coordinated products. The complexity of the light-optical properties of natural teeth can be achieved with comparatively little effort. The procedure is efficient. At the same time, many uncertain variables of all-ceramics (e.g. the influence of the framework colour, shrinkage upon sintering, the layering concept, etc.) are easy to control.

Prime example: GC Initial™ IQ ONE SQIN painting and micro-layering concept

But is the maximum result (benchmark is the conventionally layered crown) achievable with this efficient system for vestibularly reduced monolithics? Finding an answer to this question is the aim of this prime example. In order to obtain an evaluation standard, six crowns (teeth 13 to 23) would first be converted in conventional sintering technology on refractory dies

Fig. 1: Crowns layered on refractory dies (sintering technology) (GC Initial MC) as a high benchmark and basis for evaluation.

(Cosmotech Vest, GC) with layered ceramics (Initial MC, GC) (Fig. 1). This is the aesthetic benchmark for the implementation of the same crowns with the GC Initial™ IQ ONE SQIN painting and micro-layering concept.

The complete GC Initial™ IQ ONE SQIN painting and micro-layering system consists of three coordinated ceramic materials:

GC Initial IQ Lustre Pastes ONE

These 3D ceramic paints are used for the internal and external characterization of frameworks as well as the connection firing (necessary for SQIN). In-depth light dynamics (3D effect) are achieved. Lustre Pastes ONE – a further development of the popular Lustre Pastes NF – are ready-to-use, feldspar-based ceramic masses. The mixture of fine ceramic particles brings about the three-dimensional paints' colour intensity and lifelike translucency and fluorescence (Fig. 2), e.g. for monolithic restorations.

GC Initial IQ SQIN

These micro-layering ceramics are used to design morphology and surface texture. A three-dimensional surface texture with natural gloss (self-glazing) is achieved. With the

Fig. 2: Representation of the fluorescence of GC Initial IQ Lustre Pastes ONE.

SQIN ceramics, lifelike aesthetics can be achieved within a layer that is merely 0.2 – 0.6 mm thick. The balanced mixture made of feldspar-based ceramics creates a three-dimensional effect – colour, depth and natural translucency. In addition, the special Form & Texture liquid offers special processing and modelling properties to create an individualized surface texture.

GC Initial Spectrum Stains

With these universal 2D paints, individual internal and external characteristic peculiarities are realized. With their unrestricted variety of colour nuances, every situation is really taken into account.

In our comparative case, six anterior crowns were implemented with the GC Initial™ IQ ONE SQIN painting and micro-layering system and two finishing paths were chosen:

- 1st quadrant: Minimally reduced framework, painted with Lustre Pastes ONE / Spectrum Stains and then veneered with SQIN
- 2nd quadrant: Monolithics, painted with Lustre Pastes ONE / Spectrum Stains

Fig. 3: a) Fully anatomical wax-up.

Fig. 3: b) The fully anatomical wax-up was slightly bucally reduced in the 1st quadrant.

Fig. 3: c) Pressed crowns (GC Initial LiSi Press MT) on the model.

Creating the basis

The choice of framework material is an essential aspect for the result. The decision depends on various factors; for example, if the restoration is to be cemented conventionally in the mouth, zirconium oxide may be the right material. In this case, the crowns were made of lithium disilicate ceramic (Initial LiSi Press, GC) using the press technique. Initial LiSi Press offers a wide range of ingots with natural translucency. For this sample case, our "favourite" ingot with medium translucency level (MT) was used.

In the 1st quadrant, the fully anatomical wax-up was buccally reduced by about 0.5 mm in order to create space for the veneering. In the 2nd quadrant, the wax-up was pressed fully anatomically (Fig. 3). The wax-up was embedded to press all-ceramic (GC Initial LiSi Press MT ingot, shade A2) crowns. The precise fit accustomed to press ceramics ensures a smooth workflow. After grinding the sprues, the crowns were ready for completion.

Finalization with the painting technique (monolithics)

The monolithic crowns in the 2nd quadrant were completed using the painting technique. The Lustre Pastes ONE enable –in combination with the Spectrum Stains or alone – to adjust the colour, brightness, grey value and surface texture. The ceramic surfaces can be characterized sensationally easily with the 3D paints. The aesthetics of the natural-looking glaze masses are noteworthy. Without any layering, the crowns are monolithically finalized (Fig. 4).

Fig. 4: The crowns in the 2nd quadrant were finished with the painting technique. The slightly reduced crowns in the 1st quadrant were prepared for micro-layering.

Finalization with the micro-layering technique (micro-buccally reduced monolithics)

The Lustre Pastes ONE were also used for the buccally reduced crowns in the 1st quadrant. Here, they play out their strength as an internal paint. The crowns are characterized more intensively with the Lustre Pastes ONE in preparation for the veneering and then fired. This connection firing gives the structure a complex depth and turns it into the optimal basis for the micro-layering principle. The SQIN ceramics enable a colour effect full of dynamics at a low layer thickness. Thanks to the low thickness of the ceramic layer, among other things, the sinter shrinkage is extremely low to non-existent. This makes the system manageable and reproducible. Also worth mentioning is the special mixing liquid (Form & Texture liquid) with an ingenious property: when mixed with the ceramic, the latter can literally be modelled. Almost like a supple soft wax, a natural surface texture can be created. We breathe life into the restoration with a brush, so to speak. Delicate and at the same time pithy-intense – this is how the SQIN masses can be applied and processed. Experience has shown that if textures are incorporated into the surfaces during layering, more beautiful results are produced than when rotating tools are used. When the textures are "fired in", the masses blend, resulting in a natural structure. After firing, the gloss level was only adjusted by manual polishing. By gently "overdrawing" the crowns with the rubber polisher, the raised areas get a slightly smoother surface. The interplay of convex and concave surfaces, which is hardly visible to the naked eye, ensures the high naturalness. Finally, the polishing brush with diamond polishing paste was used. A few minutes later, the result was achieved.

Evaluation of the result

This sample case was made with the intention to answer the question of whether a maximum result can be achieved with minimal effort via the GC Initial™ IQ ONE SQIN painting and micro-layering system. The answer is provided by the pictures or the juxtaposition of the layered crowns (see Fig. 1) with the monolithic or micro-buccally reduced restorations. The results of the painting and micro-layering system stand up to the high bar set by "crowns layered on

Fig. 5: a) Finished restorations after manual polishing.

Fig. 5: b) The crowns in the 1st quadrant were finished with the micro-layering technique and the crowns in the 2nd quadrant with the painting technique.

Fig. 6: In comparison: The conventionally layered restorations on refractory dies.

refractory dies" (Figs. 5 and 6). With dental experience, the necessary sense of aesthetics and the required spatial thinking, excellent results can be achieved. The many parameters that determine the final result in the conventional layering technique are reduced to a minimum. And the time required for implementation is significantly lower than with layering.

Patient case: Complexity and simplicity – "The double lottery"

In day-to-day laboratory routine, the "Mini-Max principle" is a welcome solution to meet rigorous aesthetic demands and economic challenges at the same time. In the presented patient case (dentist: Dr. Dana Adyani-Fard), teeth 11 and 21 had to be supplied with all-ceramic crowns (Figs. 7 and 8). Designing two crowns standing next to each other in a nearly symmetrical manner can be a challenge with a conventional layering technique – depending on the initial situation. In this case, the crowns were made in a reproducible, simple way, using the micro-layering technique.

Clinical pre-treatment

The complexity of this case lies with the position of the teeth in the anterior region. The patient consulted the practice after anterior trauma with severe dislocation of tooth 11 and enamel-dentine fractures on both upper centrals. Tooth 11 in particular was massively misaligned. In the clinical pre-treatment, tooth 11 was repositioned and endodontically treated. Teeth 21 and 11 were initially restored with composite (G-ænial A'CHORD, Shade A2, GC). The next step was the preparation of the teeth for the all-ceramic crowns. Digital impressions were made and the data was transmitted to the laboratory for the creation of the restorations.

Fig. 7: Situation after anterior trauma. The patient desired an aesthetic improvement of the anterior teeth.

Fig. 8: Situation after clinical pre-treatment and preparation of teeth 11 and 21.

Micro-layering technique for all-ceramic restorations

In order to be able to produce crowns 11 and 21 as symmetrically and efficiently as possible, we decided on micro-layering following the aforementioned system. In the first step, the bases of the Initial LiSi Press crowns were manufactured and buccally reduced (about 0.4 mm) (Fig. 9). This low layer thickness is sufficient to achieve vividly dynamic restorations with the GC Initial™ IQ ONE SQIN painting and micro-layering system.

Fig. 9: Monolithic ceramic crowns, slightly reduced in the labial area.

As described above, the buccally reduced crowns were painted and fired with the Lustre Pastes ONE and received colour and basic fluorescence through this connection firing (Fig. 10). Now the SQIN masses were applied in a minimal layer and the crowns were supplemented in their shape. While the framework with the Lustre Pastes ONE depicts the basic colour, all other masses serve to accentuate and play with translucency, opalescence, etc. At the same time, the brush was used to create a surface texture (using the Form & Texture Liquid). After firing, the desired result was revealed (Fig. 11).

Fig. 10: Crown bases painted with Lustre Pastes ONE.

Fig. 11: Veneered with a micro-layer of SQIN ceramic.

Fig.12: a) and **b)** The finished restorations on the model – all-ceramic crowns manufactured with comparatively little effort. Clearly visible is the vivid surface texture, which could be achieved by modelling in the wet stage (Form & Texture Liquid).

Fig. 13: Try-in of the crowns in the mouth.

This was followed by manual polishing. The crowns were then sent to the dental practice and tried in the patient's mouth (Fig. 12). The intaglio surfaces of the restorations were etched with HF for 20 seconds, followed by application of G-Multi PRIMER. G-Premio BOND was applied onto the teeth in accordance with the instructions for use after a selective etch protocol. Next, the crowns were adhesively luted with a dual-cure adhesive luting composite (G-CEM LinkForce™, GC), shade A2 (Figs. 13 and 14).

Result

The patient's desire for an improvement of the anterior teeth's aesthetics was fulfilled. Without having to compromise on aesthetics and safety, we were able to produce natural-looking restorations in the laboratory with a reduced effort.

Summary

The aim of an aesthetically indicated restoration is a natural-looking result in harmony with the facial and oral environment, similar to a bouquet that only manifests in its entirety. Achieving this requires many aspects – subtleties and nuances determine the image. And it is precisely this complexity of details that makes an all-ceramic restoration in the anterior tooth area so difficult. With GC Initial IQ ONE SQIN, we enter a new level of all-ceramics. The painting and micro-layering technique makes the complexity manageable. Minimal principle of all-ceramics – with minimized use, we achieve maximum aesthetics. Nevertheless, the mini-max principle does not mean that only minimal know-how is required. Because what remains is the realization that good dental technology is always based on the interaction between high-quality products, well thought-out concepts and dental finesse.

"Producing ceramic restorations also means incentive and motivation to me. Each day, we try to get a little closer to nature and face this challenge again with every patient case. Modern materials – e.g. GC Initial IQ ONE SQIN – offer us the opportunity to continue to hone or skills with in-depth knowledge, a sense of aesthetics and artistry, without losing sight of economic efficiency." MDT Andreas Pilch

Acknowledgement

The author would like to thank Dr. Dana Adyani-Fard (Meerbusch, Germany) for her meticulous clinical work in the presented case study.

Fig. 14: a) and **b)** The result a few days after final cementation. The crowns fit naturally into the dental environment. The position of the teeth is in harmony with the lips and profile.

initial™ IQ ONE SQIN

What you paint is what you get: an all-ceramic upgrade

By **MDT Leonardo Cavallo,** Italy

*MDT **Leonardo Cavallo** qualified as dental technician in 1994 in Italy. His will to improve guided him to follow Master courses in Germany and the United States. After successful completion, he returned to Italy with a different outlook to his work. He opened his first dental laboratory in 1999, where he focused on aesthetic dentistry and restorations on implants. Since 2007, he started to use digital solutions to optimize the lab's workflow. He is a member of several scientific societies, such as ESCD and ITI. His goal is to try his best to emulate the "natural beauty" of the teeth.*

A revolutionary concept in the field of painting and microlayering of monolithic ceramics has been developed and produced by GC. It consists of three components: [1] Initial Lustre Pastes ONE (GC; Fig. 1) in the form of a paste to be used both for painting and for internal characterization in microlayering; [2] SQIN (GC), powders to complete the final contour in microlayering (the trend of the moment). [3] Initial Spectrum Stains (powder stains) can be used to increase individualization possibilities. All components can be used on zirconia as well as lithium disilicate.

The excellence, practicality and obtained aesthetic end-result of this new concept – which is called Initial IQ ONE SQIN – is illustrated with a clinical case.

An 18-year-old patient had fractured three upper incisors in an accident (Fig. 2). Given the young age of the patient, she asked the dentist to have a natural smile again in a short time. After clinical evaluation, it was decided to restore the teeth following a minimally invasive, indirect adhesive approach. A crown was planned on tooth 11 and veneers on tooth 12 and 21.

Fig. 1: Initial Lustre Pastes ONE give natural fluorescence to monolithic restorations from zirconia and lithium disilicate.

Fig. 2: Preoperative situation.

A wax-up was made and copied using a clear silicone impression material (EXACLEAR, GC). After transfer to the mouth, a mock-up was made using an injectable composite (G-ænial Universal Flo, GC; Shade A2) that allowed to give a better idea of the final result and at the same time acted as the provisional restoration (Fig. 3)

Fig. 3: Mock-up.

The veneers and crown were made of lithium disilicate (Initial LiSi Press, GC) (Fig. 4) and were characterized following the Initial IQ ONE SQIN concept to obtain a highly aesthetic restoration with natural fluorescence, while optimizing the execution times.

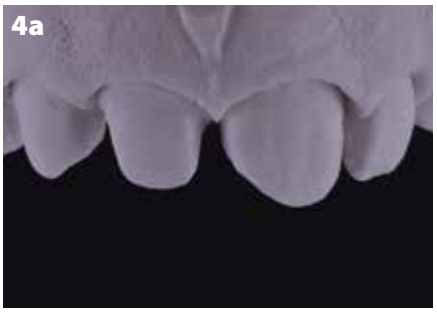

Fig. 4: (a) Gypsum model; **(b)** Lithium disilicate (Initial LiSi Press) restorations.

First, the Lustre Pastes ONE are applied (Fig. 5a). These provide color deepness and serve as the connection firing. The fired LP ONE surface was softly sandblasted with 50 µm Al2O3 before the application of the SQIN ceramic (Fig. 5b).

Fig. 5: Initial IQ ONE SQIN concept **(a)** Initial Lustre Pastes ONE **(b)** SQIN.

Fig. 6: Verification of the anatomical shape and superficial texture.

Fig. 7: After glazing

Fig. 8: Verification of the fluorescence on the model.

The SQIN gives the final texture to the restoration (Fig. 6). After the final firing, a self-glaze effect (Fig. 7) is easily obtained. In blacklight, it can be seen that the fluorescence of the restoration is increased (Fig. 8). Before the final cementation in the mouth with G-CEM Veneer (GC; Shade A2), the restorations were tried in with a glycerine-based paste (G-CEM Try-In Paste; Fig. 9). The cemented restorations gave excellent results, both from a functional and aesthetic point of view, giving back the beauty of the patient's young smile (Fig. 10). The patient was fully satisfied with the results obtained.

Fig. 9: Try-in with G-CEM Try-In Paste.

Fig. 10: Intraoral view after cementation.

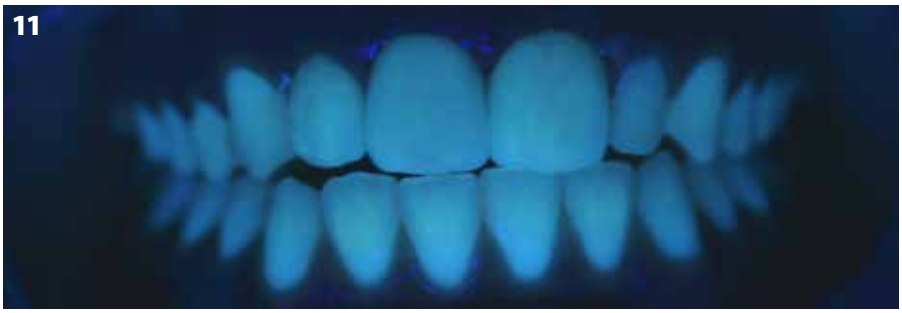

Fig. 11: Natural fluorescence of the smile. The fluorescence of the restorations is the same as that of the natural teeth.

The new Initial IQ ONE SQIN concept enables to maintain the expected quality standards both in terms of time and aesthetic result. In addition, it has been found that the production process could be optimized with these ceramics; the same material can be used on the new generation of metal- free substructures, such as zirconia and lithium disilicate for both painting of monolithics and micro-layering; meanwhile, it gives the restorations a fluorescence similar to that of natural teeth, making the restorations truly unnoticeable (Fig. 11).

Acknowledgment:

The author would like to thank Dr. Stefania Trusso (Capo d'Orlando ME, Italy) for her clinical work.


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New philosophies in ceramic layering

By **Joaquín García Arranz** (Quini) and Dr. **Ramón Asensio Acevedo**, DDS, Spain

Micro-layering is a solution that combines full-body ceramics with a very thin layer of veneering ceramics in the buccal, aesthetic zone. With current CAD-methods, a buccally reduced restoration is modelled in a jiffy. With the right materials, color deepness and natural translucency can already be obtained within a space of about 0.2 to 0.6 mm. Hence, the strength of the framework remains where needed, and within this small space, color as well as shape and (micro-)texture are easily controlled.

Joaquín García Arranz (Quini) *has been working in his private practice, dental laboratory Ortodentis, since 1991. He is also Director of the 'Dental Training Center in Madrid by Quini' and founding partner of the Fresdental Mechanization Center. Joaquín – nicknamed 'Quini' – has been lecturing on numerous national and international conferences and is Professor of the Master´s degree in Implantology at the Universidad Europea de Madrid and in Prosthetics for dental technicians at the Vericat training center. He has authored the book "Experience Group" and various other publications in national and international magazines.*

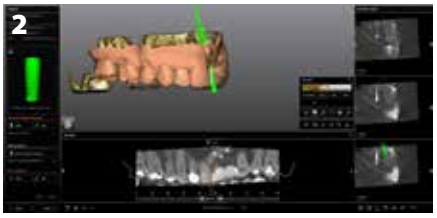
Dr. Ramón Asensio Acevedo, *DDS studied Dentistry at the Universidad Alfonso X el Sabio in Madrid (Spain). Thereafter, he obtained two more Master degrees at the Universidad Internacional de Cataluña in Barcelona: Master in Aesthetic and Restorative Dentistry and Master in Interdisciplinary Aesthetic Rehabilitation. Currently, he is assistant Professor in Aesthetic Dentistry, Endodontics and Restorative Dentistry Department at this university. He works in private practices in Madrid, Barcelona and Toledo.*

Figs. 1a-c: Initial situation: **a)** Front view; **b)** Right lateral view; **c)** Left lateral view.

Diagnosis and treatment plan

The patient consulted his dentist because he was dissatisfied with his smile. He also mentioned some pain in the upper frontal area.

During the clinical examination, it was noted that left lateral incisor was absent, which resulted in a large midline shift in the upper jaw. A fixed porcelain-fused-to-metal restoration was present on teeth 1.2, 1.1 and 2.1. Tooth 2.1 suffered periodontal loss of attachment and a large vestibular gingival recession was present (Figs. 1a-c). The current dental situation was causing occlusal instability, inadequate function and poor aesthetics.
The treatment plan consisted of an initial prophylactic phase including oral hygiene instructions and extraction of tooth 2.1. and all necessary actions were taken to stabilize periodontal health.
Once stabilized, a second phase was carried out, in which orthodontic aligners were used to correct the midline shift and to redistribute the spaces for placing an implant at the locus of tooth 2.1 (Fig. 2). The last phase consisted of the prosthetic rehabilitation of the upper anterior teeth, with veneers on teeth 1.3 and 2.3, an extension bridge from 1.2 to 2.1 with a pontic on the locus of 2.2 (Fig. 3).



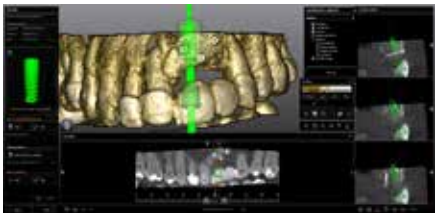


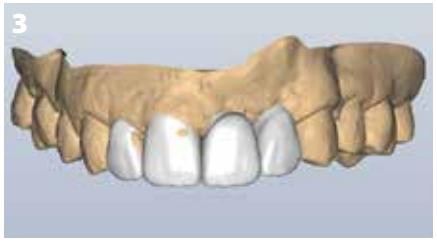
Fig. 2: Digital planning of the surgical phase

In such a particular case, combining teeth and implants in the anterior region, it's important to select the most suitable restorative material in terms of strength as well as aesthetics and carefully consider the restorative design, obtaining the maximum profitability for its integration.

Surgical intervention

After the orthodontic treatment with aligners, the marked bone defect caused by a long-evolving infection at the locus of tooth 2.1 was regenerated.

For this intervention, autologous bone was chosen for the guided bone regeneration, being considered the "golden standard". The SBB (split bone block) technique was used, initially described by Khoury *et al.*[1] This technique consists of obtaining a bone graft of the jaw branch that is subsequently divided into two cortical sheets that are fixed in the defect area by screws, and then autologous bone scratched from the bone graft itself is placed between the two sheets.



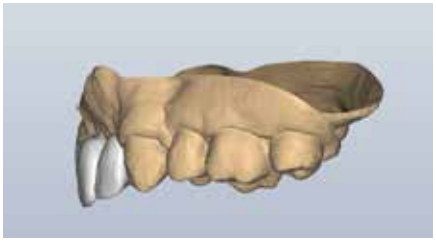


Fig. 3: Digital planning of the prosthetic restoration

The intervention is concluded with a tension-free closure using stitches in the area (Fig. 4).

Four months after the horizontal ridge augmentation, the implant was placed in the regenerated area using guided surgery (Fig. 5). When this area was exposed, a horizontal gain of bone was found. After implant placement, the volume of soft tissue was optimized by two connective tissue grafts; one from the palate and one from the tuberosity region.

Restorative design

A standard, prefabricated abutment that could be modified by grinding was chosen (Fig. 6a). Small modifications were made, that were however of great importance. The abutment was customized by under-contouring the subcritical area as much as possible, modifying the margins, especially the mesial margin and lengthening the distal area, to have sufficient support for the secondary structure to rest on (Fig. 6b).

Zirconia was chosen for the restoration framework from 2.2 to 1.2. This material allows to make the design in the subcritical area of the emergence profile as undercontoured as possible, following the design of the abutment interface to create a fully polished, seamless profile, providing a smooth surface in contact with the mucosa.

In the design, the full volume was kept on the palatal side to ensure a durable restoration over time and to avoid chipping problems due to protrusive or lateral movements.

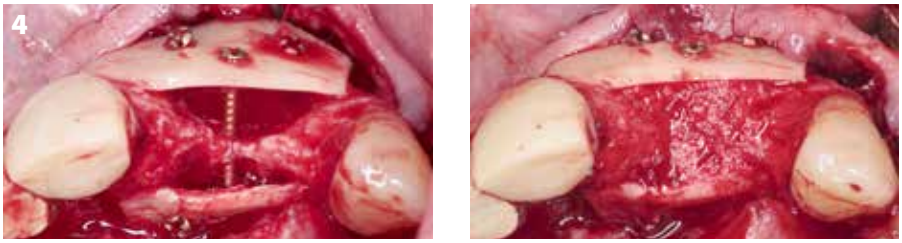


Fig. 4: Horizontal ridge augmentation with autologous bone using the split bone block technique[1].

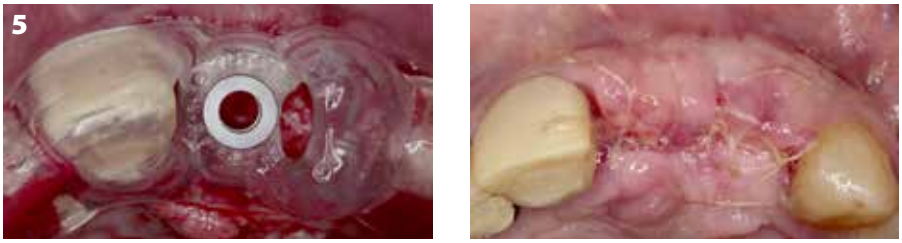


Fig. 5: Guided implant surgery

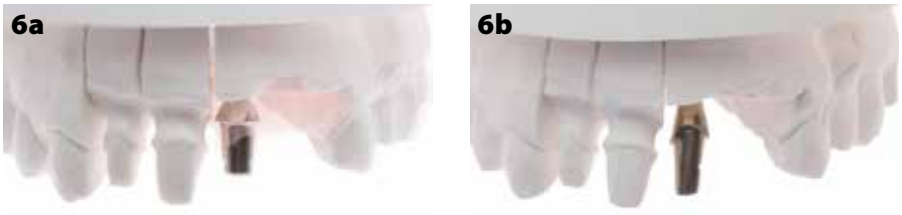


Fig. 6: a) Standard abutment; **b)** Modified abutment

Colored zirconia was as used with the same substrate or nuance of the patient's base dentin, which was A3 in this case. A micro-reduction of about 0.2-0.3 mm was created at the vestibular side for future micro-stratification (Fig. 7).

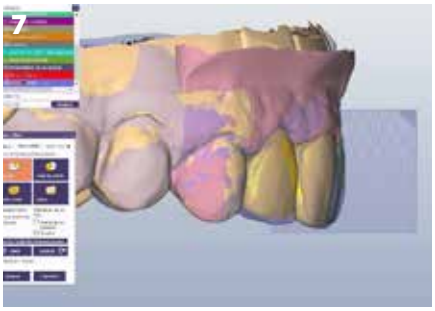


Fig. 7: Digital design of the restorative framework in zirconia

Fig. 8: Fluorescence of the Initial IQ Lustre Pastes ONE

Fig. 9: a); b) Close-up of the zirconia framework. Color was added with a mixture of Initial IQ Lustre Pastes ONE and Initial Spectrum Stains.

Characterization: internal staining

Nowadays, a wide range of possibilities exist to characterize ceramic restorations. The combination of Lustre Pastes ONE and Spectrum Stains provides the ability to establish all color effects, both internally and externally.

A great difference can be seen in comparison to the older paints and stains, with much more luminosity and incredible fluorescence (Fig. 8).

Once sintered, the framework was prepared on the model, the occlusion verified and so it was ready for micro-layering.

The internal staining was done with a combination of Lustre Pastes ONE with Spectrum Stains to intensify some color details.

To mimic the mamelon structure, a combination of SPS-13 (Twilight) and SPS-16 (Midnight) was used. Next, the incisal halo was accentuated using a mixture of SPS-1 (Ivory White) and SPS-2 (Melon Yellow).

Mesially and distally of the incisal edge, Lustre Pastes ONE Body A mixed with either SPS-2 or SPS-4 (Light Terracotta) were alternatingly applied for bright contrasts and saturation, respectively. Further mesially and distally up to the cervical margin, L-6 (Dark Blue) was used. In the middle and cervical third, Lustre Pastes ONE Body B was used to give the zirconia framework a bit more saturation; here, SPS-13 was used on either side of the centrofacial lobe to further accentuate the developmental depressions towards cervical.

Layering: form and texture

Once the Lustre Pastes are fired in the furnace, all colors are fixed in place and serve as a connection layer. Depending on the chosen shade, this can be done in multiple firings. After the internal characterization, a texturizing ceramic material (Initial IQ SQIN) that was introduced together with Lustre Pastes ONE and Spectrum Stains as a new innovative concept was used to add shape, texture and gloss. A great advantage of this concept is that the same ceramic can serve for different restorative materials, such as zirconia and lithium disilicate.

The area of the mamelons was layered with Translucent TO (Opal Booster) combined with the enamels E-57 to E-59. Translucent TO was also used for the line angles of the tooth.

Since the zirconia was precolored in the base color, there was no need to add dentin ceramic; only a thin enamel layer was applied (Fig. 10).

The SQIN ceramics are much easier to handle than a conventional ceramic as the feeling on the brush is very consistent. Due to the Form & Texture liquid, it stays very well on any surface where it is placed at and compared to other ceramics, there is virtually no shrinkage. In case of zirconia, the restoration is fired at a temperature of approximately 760°C, depending on the furnace.

Fig. 10: The finished zirconia restoration, characterized with the Initial IQ ONE SQIN system.

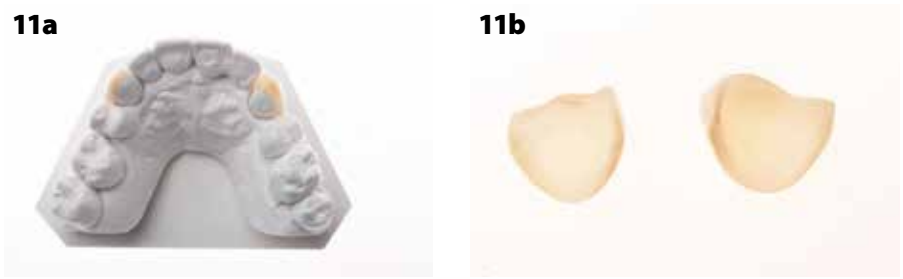


Fig. 11: Lithium disilicate veneers on teeth 13 and 23. The characterization was done with the Lustre Pastes ONE and Spectrum Stains from the same Initial IQ ONE SQIN system as was used for the zirconia bridge.

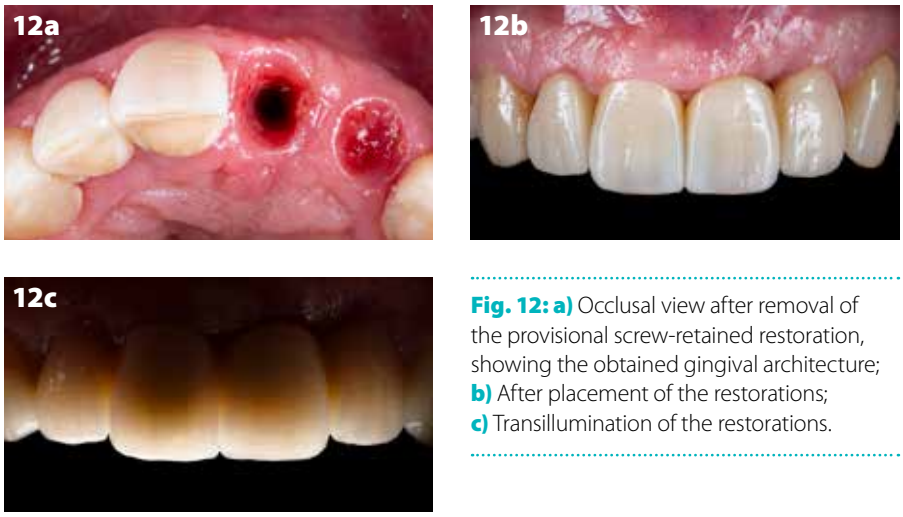


Fig. 12: a) Occlusal view after removal of the provisional screw-retained restoration, showing the obtained gingival architecture; **b)** After placement of the restorations; **c)** Transillumination of the restorations.

Fig. 13: Final result (front view), showing a natural-looking and harmonious dentition.

As the final phase, lithium disilicate veneers (Fig. 11) were made on the canines combining the Lustre Pastes ONE with the Spectrum Stains.

The great advantage of the micro-buccal layering is that adding texture is much easier than on full-body lithium disilicate or zirconia, which is more difficult to manipulate because of its extreme hardness, even though SQIN is more dense than conventional veneering ceramics. It allows to control the luminosity and the fluorescence, seeing a noticeable difference in blacklight or fluorescent light after finishing the surface, making it resemble the natural tooth (Figs. 12 and 13).

Fig. 14: a) Adding color to the gingival area with Initial Lustre Pastes GUM; **b)** Adding texture with Initial IQ SQIN GUM; **c)** The finished gingival area nicely shows an 'orange peel effect'.

Gingiva

The Initial IQ SQIN GUM shades also enable us to use ceramics for atrophied jaw restorations where we need pink aesthetics. Combined with the Initial IQ Lustre Pastes GUM shades, the main color is intensified first (Fig. 14a).

This system enables micro-layering with the same philosophy as for the white aesthetics with different shades of color, adding subtle contrasts with its different masses, adding details to the surface (Fig. 14b) such as an orange peel effect (Fig. 14c).

Conclusion

With the Lustre Pastes ONE characterization serving as a connection layer, the SQIN ceramics to refine the form and texture and the Spectrum Stains for infinite shade variations, only a minimal cut-back on the vestibular part is needed to control the texture, fluorescence and transillumination for mimicking natural teeth. Adding the possibility of the same concept for pink aesthetics with the GUM shades, we have a complete concept at our hands.

Reference

Khoury F, Hanser T. Three-Dimensional Vertical Alveolar Ridge Augmentation in the Posterior Maxilla: A 10-year Clinical Study. Int J Oral Maxillofac Implants. 2019 Mar/Apr;34(2):471-4

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ONE SQIN

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