

First Experiences with the "One Body System IQ" from GC

# Dental Intelligence

An article by Michael Brusch, MDT, Düsseldorf, Germany

High quality is not enough anymore; price is ruling the market. Such circumstances brought Michael Brusch, MDT, known for his high quality and bio-aesthetical build-up technique, to find an alternative.

It was urgent to find for the very busy and cost-conscious laboratories, a method which makes it possible to produce high quality, aesthetically satisfying restorations, without having to invest a large amount of money, and at the same time to make a product that has an attractive price for the patient.

With GC's new product line GC Initial-IQ, The One Body System the technician, as well as the patient, has found an aesthetic but also cost-effective alternative.

Indications: Press-Over, One Body, 3-dimensional Lustre Paste

## The Material

IQ is a new concept for the press-over technique of metal and press-over zircon-oxide frames. It is possible to fabricate both posterior and anterior teeth with this special technique.

The company has succeeded in producing a pellet (ingot), which has traditional qualities, like chroma (dentine) and fluorescence, and a special effect using light dynamics for the anterior teeth to create a 3-dimensional result.

This allows the laboratory to produce high quality crowns and bridges with a full anatomical wax up.

With this ingenious technique combined with new materials, it is easy to achieve results that are high in quality, similar to those fabricated with the complex build-up technique, in Vita Classical shades.

The known disadvantages of the press techniques were solved with the following process of production. Until now, it was necessary to cut back pressed anterior teeth and layer with ceramic to achieve acceptable results. For the posterior teeth, it was necessary to stain and glaze several times (up to four times) to achieve acceptable results. With the new IQ system, it is sufficient to bake only once! The exception to the one firing process is the

pressed-over Zirconia which needs two firings to achieve the three-dimensional results you are looking for.

Press-to	IQ Press-over
<ul style="list-style-type: none"> <li><input type="checkbox"/> Selective build-up of the pressed core</li> <li><input type="checkbox"/> Full covering of the pressed core</li> <li><input type="checkbox"/> Several stain bakes over the pressed core</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> IQ Lustre bake</li> </ul>

Comparison of the different working steps for the conventional pressed technique and the new IQ Press-over.

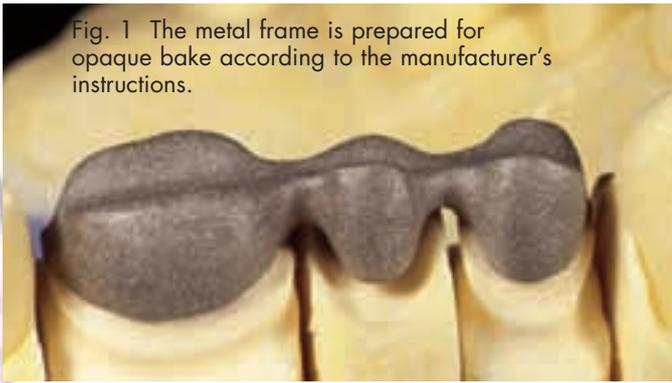


Fig. 1 The metal frame is prepared for opaque bake according to the manufacturer's instructions.

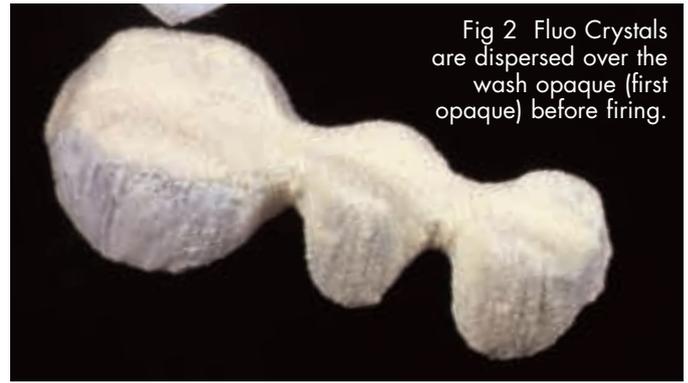


Fig 2 Fluo Crystals are dispersed over the wash opaque (first opaque) before firing.



Fig. 3 These Fluo Crystals are building the basics for ....

Vita Color	Opaque	Press pellet
A1	A1	A1
A2	A2/A3	A1
A3	A3,5	A2
A3,5	A4	A2
A4	A4	A2

Equivalent Initial Line colours to Vita Shade Guide

### The Colour Concept

Sixteen Vita shades are produced with only seven different press pellets, four body Lustre Pastes, one Neutral Lustre Paste and one Effect Lustre Paste (grey). There are six additional Effect Lustre Pastes, as well as the INITIAL stains and three bleach pellets, that offer the user a variety of products for the individualisation of their cases.



The Lustre Pastes Set contains pastes of one Neutral, four Body Lustre Pastes and seven Effect Lustre Pastes. The set was designed to be used for both the pressed-over-zircon and the pressed-over-metal.

The IQ system is user-friendly, cost-effective, uncomplicated and produces high quality restorations. In direct comparison to the conventional build up technique, its complicated fabrication and its high costs are evident, and the conventional technique has to be classified in a different category. The knowledge and the know-how of the layered powder build up technique is the recognized universal basis for natural looking restorations.

### The Application/Tips

The metal or Zirconia frames, fabricated manually or with a CAD/CAM system, in the lab or through outsourcing (Fig. 1 and 6).

The price of a CAD/CAM produced framework is approximately £40 to £120 depending on where you are outsourcing. Therefore, the laboratory has some financial latitude with respect to the individual financial requirements of the patient.

When the "One Body System" is used, in place of other conventional techniques that are more costly and labour intensive, you have the option to utilise the IQ system, as the steps for fabrication of an IQ restoration are very easy.

For pressing over metal, the existing Initial MC Paste Opaques are used. To produce the important even masking opaque layer for the press technique, I recommend the high fluorescent dispersion crystals (Fluo Crystals) of the system to apply on to the first opaque bake (Fig. 2 and 3).



Fig. 4 and 5 ... the very important, even layer of the second opaque bake.



Fig. 6 On the pre-coloured zirconia frames,....



Fig. 7 ... apply a thin wash-layer of Power Frame Modifier ...



Fig. 8 and 9 ... which enables us to change the frame structure in colour and fluorescence.



Fig. 10 to 13 Over the opaqued frames a full anatomical form is waxed up. The wax-up should look like the expected result in ceramic.

The second opaque firing should be as usual, and the existing Opaque Modifiers of Initial can be used to create a more vivid opaque colour (Fig. 4 and 5). Except for A1, B1, C1, all colours are applied one colour tone darker.

The same technique is used for the zirconium frames, where only pre-coloured copings should be used (Fig. 6).

At this point, I can not give a general colour order for the sixteen Vita shades since the colour liquids of each manufacturer are different. When applying the Lustre Pastes, a visual match has to be achieved with the shade guide.

Exceptionally good shades are achieved by using the Lava colours. Four Zr Power Modifiers can give a colour and fluorescent individualisation to each case. The Power Frame Modifier is applied extremely thin, like a wash-opaque and then fired (Fig. 7 to 9).

### Over-pressing

The prepared zirconia/metal frames are waxed-up in a full anatomical form. Attention must be paid to ensure that the wax-up is done in such a manner, that its result is equal to that of the desired ceramic restoration (Fig. 10 to 13).



Fig.14 and 15 The waxed up objects are sprued in the same manner as the all ceramic press techniques.



Fig.16 Through the additional bar reservoir, a better press result is ensured for bridges.



Fig.17 Here is a sprued bridge with a bar reservoir ready to be invested and pressed.

The sprueing is exactly the same procedure to that of the all ceramic press technique (Fig. 14 and 15 and 20). Bridges, however, should have a runner bar (Fig. 16 and 17).

The pressing has to be carried out according to the manufacturer's instructions (Fig. 18 to 22). To avoid miss-presses, it is absolutely necessary to calibrate the pressing furnace. For example, a pressing temperature which is too low, changes the CTE of the press-ceramic and may cause cracks to the pressed ceramic.

The grinding of the pressed object can be done with the usual instruments. Be careful when working

close to the transition areas, like the transition between zirconia/metal frames and a porcelain shoulder. Coarse grinders or diamonds should be avoided, as well as a high pressure on the ceramic when grinding and a high revolution of the hand piece. Should the ceramic chip, it is possible to repair such "areas" with the correction powder in the kit.

With Zirconia frames, a ceramic shoulder should be avoided. Because of the high translucency of the zirconia's ceramic margin, more work would be required for a better aesthetic restoration. The margin should always be supported by zircon-dioxide frame material.

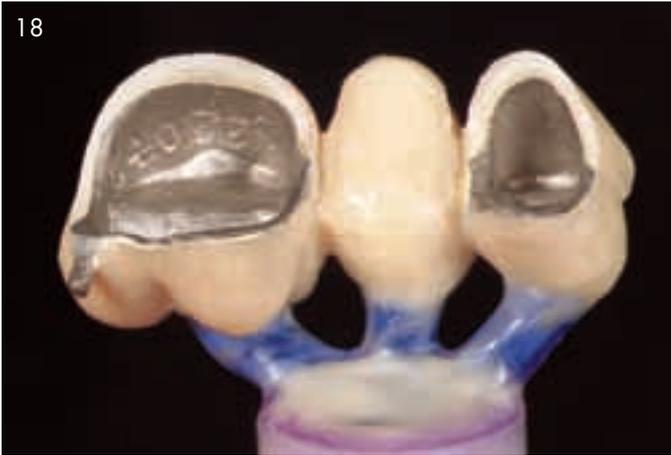


Fig.18 The investing and pressing is followed according to the parameters and instructions of the manufacturer.



Fig.19 to 22 Pressed results of zirconia and metal frames with and without ceramic shoulders. Zirconia frames should not be pressed with ceramic shoulders.

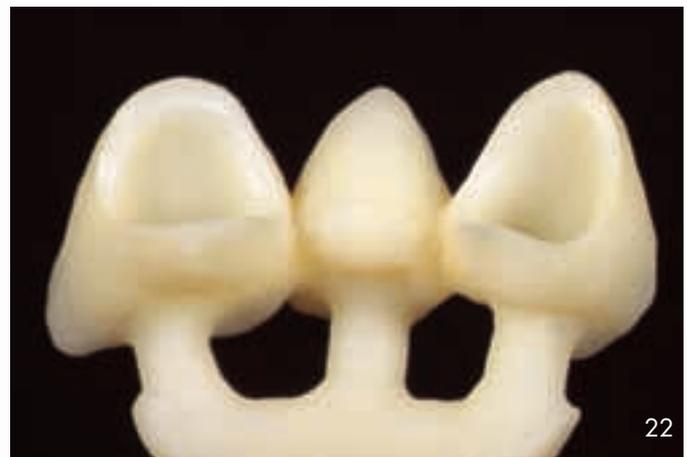




Fig. 23 The finished bridge is sandblasted and painted with ...



Fig. 24 ... Neutral Lustre Paste. Visibly "thicker", than we are used to from a normal glaze application.



Fig. 25 The entire surface is completely covered with Neutral Lustre Paste



Fig. 26 The desired Vita Classical tooth shade is created by a more or less intensive application of the Body Lustre pastes A to D. That's all!

### Further processing

The finished pressed crowns/bridges are sandblasted with 50µm aluminium oxide/1.5 bars of pressure and cleaned before the lustre bake (glaze firing) (Fig. 23).

**!** The Vitapan Classical colours are created by use of the Lustre Paste Neutral, covering the complete surface and a more or less intensive application of the Body Lustre Pastes (A to D). To increase the grey in the incisal area with dark shades (A3.5, A4, C3, C4) (Fig. 27) the IQ Lustre Set offers two grey Lustre Effect Pastes. More is not necessary!

In case more individualisation is required, five more Effect Lustre Pastes and the INvivo stains of the Initial MC assortment can be used (Fig. 28 to 32).

The IQ technique, the Vita Classical shades, and the individualised special case, can be compared visually

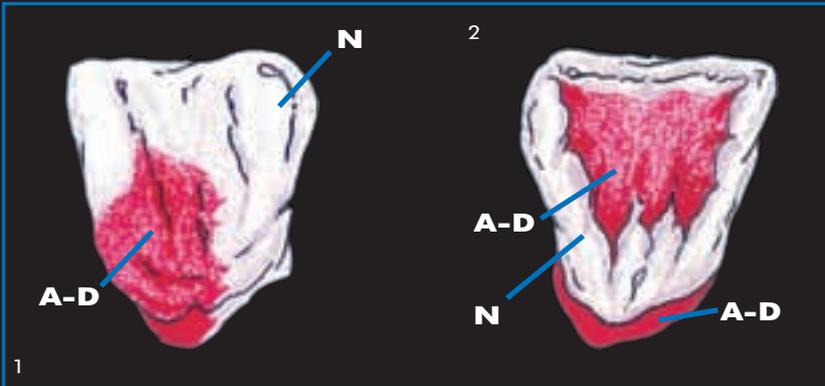
with the application of the pastes and stains according to "painting by numbers".

As illustrated in the following drawings, it is obvious that the numbered Effect and Body Lustre Pastes are always placed at the same part of the tooth. This is possible, in a few working steps, with this light dynamic pressed core, (look at the pictured instructions for use, drawings according to "painting by Numbers").

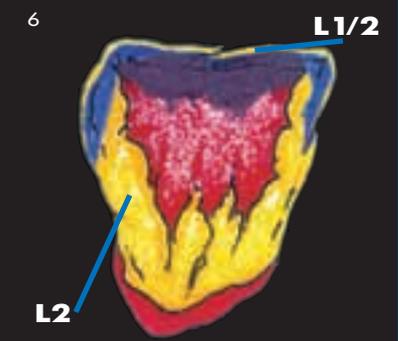
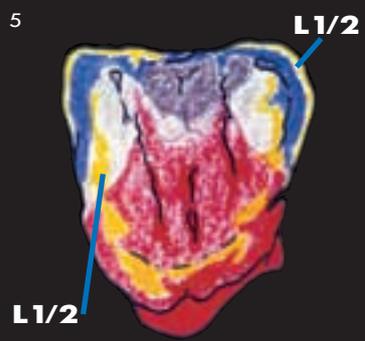
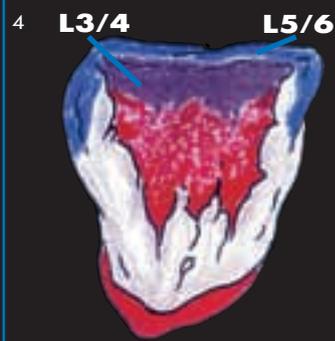
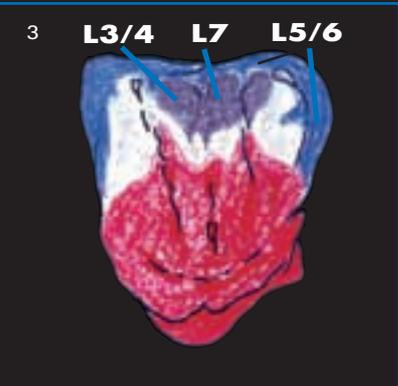
The following practical example shows that the Lustre Paste is painted on visibly thicker than a regular stain or glaze (Fig. 24).

The primary colour is applied with the Neutral Lustre Pastes and Body Lustre Pastes A to D, depending on the tooth colour, until the optimal result is reached according to the Vita Classical shade guide (This procedure takes approximately two minutes, Fig. 24 to 26).

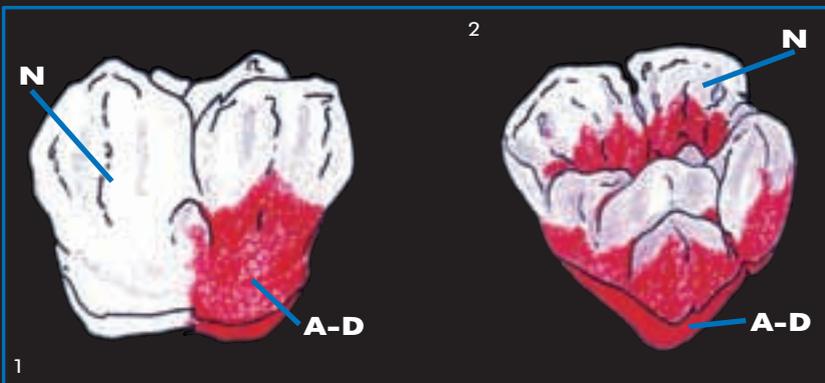
**IQ Basic**



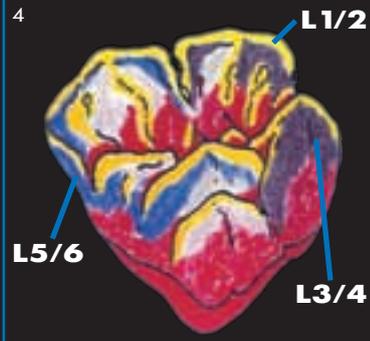
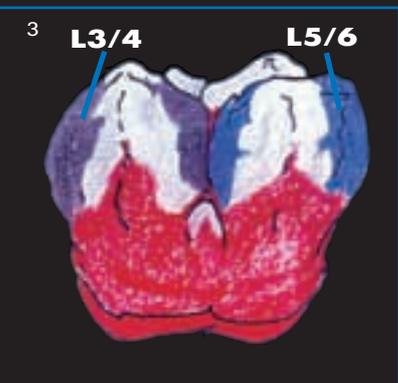
**IQ Individual**



**IQ Basic**



**IQ Individual**



1 and 2 – IQ Basic:  
**N** – Lustre Neutral  
**A-D** – Lustre Body  
 (Sufficient for One Vita-Classic Standard colour)

3 to 6 and 3 to 5 – IQ Individual:  
**L1** – vanilla  
**L2** – white  
**L3** – light grey  
**L4** – dark grey  
**L5** – light blue  
**L6** – dark blue  
**L7** – INcisor



Fig. 27 Only very dark and/or grey colours (A3.5, A4, C3) need to be enhanced from palatal with the two grey Effect Lustre Pastes to increase the grey (translucent) effect of the enamel.



Fig. 28 For an individualisation, the two whitish Lustre Pastes can be used to brighten ...



Fig. 29 ... or the two bluish Lustre Pastes to create contrast in the incisal areas ...



Fig. 30 ... and the two greyish Effect Lustre Pastes are used to increase the transparency.



Fig. 31 and 32 For other characteristics, the INvivo Stains in the Initial MC/LF set are applied.



Fig. 33 and 34 The surface textures of the Lustré Pastes can be altered by light vibration with an instrument or tapping the model on your desk top.



Fig. 35 and 36 The only once fired end result!

Effect and Body Lustré Pastes are placed on the surface, similar to oil paint, which is very stable on the object. With these high thixotropic quality products on hand it is easy to create a structured tooth surface. The desired surface smoothness is achieved after the Lustré Paste application by vibration of the model, or by light vibrations of the removed bridge (Fig. 33 and 34).

Figures 35 and 36 show the only once firing result. The glaze firing is carried out in the same way; working with Zirconia or metal restorations, and depending on individual ceramic furnaces, the temperature should be between 780°C and 810°C (Fig. 37 to 41). It is enough to fire Lustré Paste only once. With zirconia restorations a Neutral Lustré firing has to be done before colouring. Corrections of the glaze or

colour can be carried out in a second Lustré Paste firing. Mechanical polishing, for example with pumice, is another option.

The Lustré material is a liquid ceramic mix, which can be handled like a layering ceramic powder.

Even with occlusal adjustments during insertion, the overall aesthetic quality is not compromised, since the core material is dispersing light.

“New” with the zirconia pellets, is a high content of feldspar, which is similar to the pellets for metal, which produces optimal light dispersion. Images from 42 to 51 give a summary of the spectrum potential of the Initial IQ Press-over System. All restorations are painted with the Lustré Pastes only once and then fired.



Fig. 37 to 41 The procedure for metal reinforced posterior bridge (Fig.37 and 38) and the Zr restorations (Fig. 39 to 41) is identical, except for the Lustre firing with Zr restorations which needs two lustre firings.

Fig. 42 and 51  
 A look into the  
 unlimited perfor-  
 mance spectrum of  
 the Initial IQ Press-  
 over System.  
 All restorations  
 are fired only  
 once with the  
 Lustre Pastes.





Fig. 52 and 53 Pressed-over frames can easily be reduced and then built up again with ceramic powders.



Fig. 54 and 55 Because of the high translucency of the pressed ceramic dentin, it is necessary to add chroma to the surface with the initial INvivo Zr/MC stains, before continuing with the layering of the powders. The stains are fixed during the glaze firing.

## The Layering Technique

“The IQ Press-over System” can be used, because of its special composition, for the layering technique as well, although it was not created for this purpose (Fig. 52 and 53).

Since the press results are relatively transparent, care has to be taken, that the finished dentin core is stained with the normal stains of the Initial kits Zr/MC, to the approximate chroma level desired (Fig. 54 and 55). These are fixed with a glaze firing at 780°C for 1 minute onto the dentin core.

**Attention!**  
For the internal staining  
the Lustre Pastes may not be used.

The layering technique with effect powders (by example INside) enamel and transparent powders are applied in the normal manner to duplicate natural tooth structure (Fig. 56 to 59).

For the zirconia restorations, the Initial Zr incisal powders are used, and for pressed over metal restorations the existing Initial LF ceramic is used. The results from this technique speak for themselves (Fig. 60 to 66).



Fig. 56 and 57 The dentin core is covered with high fluorescent transparent powder (CLF). Then the Opal/Enamel powders are built up to the finished tooth form.



Fig. 58 The tooth form is finalised with opal and enamel powders.



Fig. 59 The result after firing. A correction bake is often not necessary.



Fig. 60 to 62 The glaze firing result can not be differentiated from a high quality multi-layering technique.



Fig. 63 The situation before treatment ...



Fig. 64 ... and the end-result...



Fig. 65 and 66 ... frames are pressed and then layered with powder. Please notice the light dispersion of the new feldspathic ceramic.

## 2. Patient Case – IQ, painting by numbers

After all the research had been thought through and tested, the theoretical variations were solved, it is now time to put into practice what we developed and master the first real case (Fig. 67 and 68).

You can visualise again, all of the working steps, which are necessary for an inexpensive, efficient IQ restoration (Fig. 69 to 75 and 77 to 81, 84 and 85).

The whole maxilla restoration, after the fabrication of the frame and the opaque, was waxed-up to its final form with prefabricated wax veneers (Fig. 71). With a little practice, this technique results in reducing labour costs.

All the following steps of production have been described previously. In my opinion, the obtained result can keep up with a standard build-up technique (Fig. 86 to 93).



Fig. 67 The situation of the patient. This case was fabricated with the easy "painting by numbers" technique of the IQ System, without layering.



Fig. 68 From the prepped situation ...



Fig. 69 and 70 ... to the metal frame with prepared ceramic shoulders. The fluorescent crystals on the wash-opaque (Fig. 69) result in a perfect and even opaque layer.



Fig. 71 For the anatomical wax-up of the anterior and posterior teeth, wax veneers are used.



Fig. 72 The pressing is carried out according to the prior parameters.



Fig. 73 The fitting of the pressed ceramic shoulder is very exact and saves a tremendous amount of time.



Fig. 74 to 78 The trimming or finishing of the surface and the margin are done with the usual instrumentation of burs, diamonds and silicone wheels. The following is the application of the Lustre Pastes.



Fig. 79 to 85 The step by step procedure



Fig. 86 to 90  
Sequence of the only one  
Lustre Paste bake,  
fired 14 unit restoration  
with 14 ceramic shoulders  
on the model.

Fig. 91 and 92  
The end result in the  
mouth of the patient.  
A cost effective,  
convincing restoration  
achieved without  
ceramic layering.

91



92





Fig. 93 and 94 show again the aesthetic possibilities of the IQ – the One Body System.

Product list		
Indication	Name of product	Manufacturer
Investment Die Stone Press ceramic	MultiPressVest	GCE
	Fujirock EP	GCE
	GC Initial IQ, One Body, Press-over Zircondioxid/Metall	GCE
Veneering Ceramic Wax	Initial ZR, Initial LF	GCE
	Inlay soft	GCE/Polz Schuler Dental Wichnalek, MDT Dr. Hajtó
Wax veneers		

This system is not supposed to be the answer for the "China-Crown". It is more or less what we technicians are longing for, a financial and mainly an aesthetic alternative, which gives the patient the assurance and advantage of a personalized service by having the dental laboratory close by. □

*Don't miss the opportunity to see Michael Brusch at the Welcome to the Future Meeting, 7-8th March 2008 – see events pages for more details.*

**Author**

Michael Brusch finished his training as a dental technician in 1979. In 1986 he graduated as a master technician in Düsseldorf, Germany. From 1986 to 1989 he worked as a laboratory manager with a focal point on ceramics. In 1989, he opened his own laboratory and specialised in functional and aesthetic restorations. Michael concentrates on polychroma-additive veneering techniques for composite and ceramics, as well as precision techniques for crowns, inlays, onlays and veneers made out of composite and ceramic. He is an active member of the "Deutsche Gesellschaft für Ästhetische Zahnheilkunde (DGÄZ)" and of the "dental excellence –International Laboratory Group".



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