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Proud of our History, Looking Forward to the Future

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A new solution for highly aesthetic implant restorations.

By Iain Baldwin RDT

Learning Objectives – By reading this article you will learn: You will be able to identify the basic properties of visio.lign system and how those properties could be used to enhance the longevity of dental restorations, especially large implant supported frameworks."

In dental technology we are lucky enough to have the support of companies that are investing huge amounts of time and money to innovate and improve upon the range of materials and solutions we have available for our clients and their patients.

But in order to be worth having in the lab or surgery, they surely need to be an improvement on what we currently have.

In this article I'd like to highlight a material that, in our opinion, will become the gold standard for restoring implant restorations. We find it offers outstanding aesthetics, durability and perhaps most importantly the ability to adjust, repair and finish orally.

This month we'll look at visio.lign and all the benefits it has brought to both the dental laboratory and surgery, and most importantly the patient.

What's wrong with the solutions we currently have?

I suppose before we look at a new solution, we have to answer the question 'what's wrong with the materials we have?'

The laboratory I work in has produced many full arch porcelain bonded implant restorations, and had fantastic results doing so over many years. However it does have potential drawbacks.

Shock absorbency Although porcelain offers a fantastic aesthetic result, it is a very unforgiving material and prone to cracking or fracture if any underlying occlusal issue has not been identified and addressed. This is specially true when restoring on top of implants.

We have seen instances of porcelain chipping or fracturing on full arch implant cases after only a few years in the mouth, even though these were all adequately supported by the substructures.

Alteration Once a porcelain bridge has been fitted in the mouth it is difficult to adjust and refinish, which can also lead to porcelain cracking if not handled correctly as stresses can be introduced during the adjustment of the porcelain.

Long-term cost Once the ceramic bridge does start to chip and fail there will be the very expensive cost of a full remake.

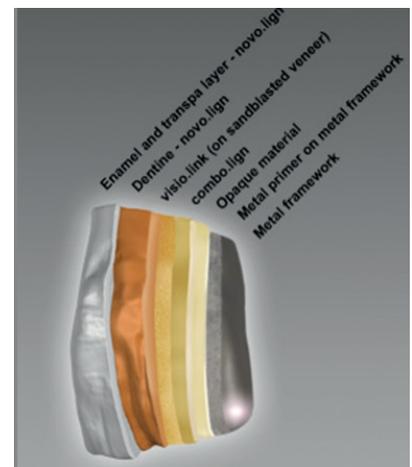


Figure 1: The layering technique bolsters visio.lign's bond strength



Figure 2: The key to the strength and bond comes from Combo.lign

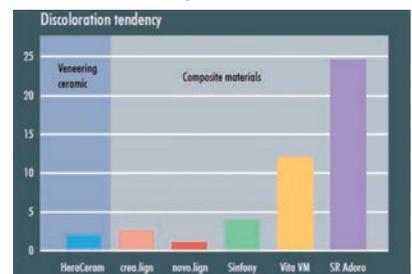


Figure 3: Average tendency to discoloration of composite materials compared to HeraCeram ceramic after storage in coffee, tea, tobacco, red wine and methylene blue. Research report from the university of Jena on material testing of veneering materials, July 15, 2010, by Dr. A. Rzanny and Dr. R. Göbel

With new materials such as visio.lign coming onto the market, we have the ability to maintain them for longer and also reduce the cost of renovating the restoration because the underlying implant frameworks can be re-used.

In our experience, once a porcelain bonded to metal implant bridge has been fitted for a few years it is not advisable to strip off the ceramic and re-use the original framework.

During the creation of the original bridge, the framework underwent numerous firing cycles. Once the stresses of being under load are factored in, the framework is not suitable for stripping off and re-firing as the ceramic could simply start to crack due to stresses or a degraded bond strength.

We'd rather not take the risk if we cannot have 100% confidence in

the very foundation upon which our restoration is to be carried.

What's so special about visio.lign?

Strong - visio.lign has a fantastic bond strength and unlike many other materials used for full arch implant restorations, it is less likely to fracture.

This is due to the layering technique, (Figure 1) which not only allows us to create natural looking teeth, but also allows the material to act as a buffer to absorb the shock of the opposing dentition.

This is a massive benefit for full arch implant cases as the patients have limited or no proprioception, which can lead to chipping and fracturing of material such as acrylic and, more likely, porcelain due to their brittle properties.

This also goes for acrylic teeth which are layered in a specific way, often meaning that upon heavy adjustment in limited space, the bond strength and aesthetics can be compromised. We have seen a few acrylic cases on implant beams where the teeth have cracked in half due to the stresses in the mouth. Once this happens the whole thing needs removing to be repaired properly. This is both inconvenient for the patient who may have to go back to a temporary denture and time consuming for the surgeon.

visio.lign is perfect for cases where there is not as much room as a full acrylic tooth would require, allowing us to build stronger, more stable CAD/CAM substructures for our all on 4 cases and layer them to give a beautiful natural aesthetic result.

The key to the strength and bond comes from combo.lign, (Figure 2) which is:

- Light-curing and self-curing
- Separate catalyst allows longer storage
- University tested bonding system
- Compatible with all metal primers
- Compatible with all silanization techniques

Durable - The biggest benefit to the visiolign system is the fact that it's incredibly resilient to staining and plaque adhesion.

This means that we are offering a highly aesthetic implant restoration with a very low discoloration tendency, just like natural dentition or ceramics.

There's nothing worse than seeing a full arch implant restoration years after fit and it looking very poor aesthetically due to discoloration.

Using the visiolign material we can now avoid this. (Figure 3)

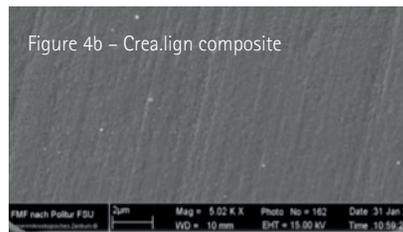
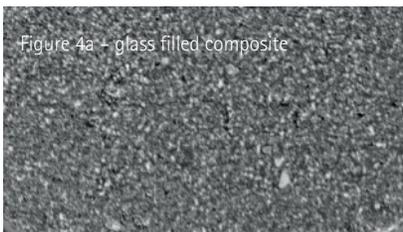


Figure 4: The Crea.lign material ensures the low staining and plaque adhesion. Source: Dr A. Rzanny, 2007-2008 Friedrich-Schiller University Jena, Germany



Figures 5-7: The facings on the left are Novo.lign facings; those on the right have been custom-built



Figure 8: The framework is designed to provide sufficient space whilst also providing optimal support for the layering material



Figure 9: The bar is blasted and treated with metal primer

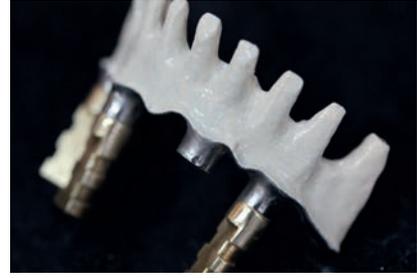


Figure 10: We opaque the bar so it is ready to have the setup transferred onto it



Figure 11: The matrix with the facings sat in place



Figure 12: The facings are set onto the bar using Combo.lign and checked against the tooth position matrix



Figures 13-14: The facings are back filled with graduated shades of Crea.lign to give the depth and specific shading required

Maintainable - Unlike ceramics, when you use visio.lign material it is possible to adjust, add and modify in the mouth.

You can then polish and it will still have the same stain and plaque resistance as when it left the lab, which in studies has been shown to be very similar to ceramics.

To ensure the best results, all added material should only be the crea.lign material which, like the novo.lign and neo.lign teeth, is also not glass filled

(unlike some other composites).

It's this non-porous composite material that ensures the low staining and plaque adhesion as shown in Figure 4.

How do we use it?

So after the background on the system, its components and the reasons why we think it's an improvement of some of the current solutions available, here's an example of how we use it in the lab.

We provide a full setup using the actual facings that will be used in the final bridge. By using shaded waxes behind the facing we can give an exact replica of the final aesthetic result.

The case that we have used for this article is a demonstration case to show the high versatility of the visio.lign system. The facings on the patient's right (LHS as you look at the images 5-7) are Novo.lign facings and have remained almost unaltered.

The facings on the patient's left (RHS as you look at the images 5-7) have been custom built in the laboratory using an inverse layering technique to give a specific aesthetic outcome that cannot be achieved using the stock novo.lign facings. Thanks to this versatility we are not limited to restoring with a set amount of tooth moulds and shades with the visio.lign system.

Once approved by the patient

and surgeon, we have a CAD/CAM bar made to a design that supports the visio.lign perfectly.

The setup is scanned and the framework designed to provide sufficient space whilst also providing optimal support for the layering material.

You can see that we design the supports to be in an ideal position for the material we will be replacing (Figure 8).

Once we have verified that the bar is in the ideal position it is blasted and treated with metal primer as shown in figure 9.

We then opaque the bar (Figure 10).

The bar is now ready to have the setup transferred onto it.

So we create a special matrix around the teeth that will hold them in the right position, sit accurately and allow light to pass through for light curing the Combo.lign and Crea.lign materials.

Figure 11 is an example of the matrix with the facings sat in place.

The facings are then set onto the bar using Combo.lign and checked against the tooth position matrix to ensure no movement has occurred (Figure 12).

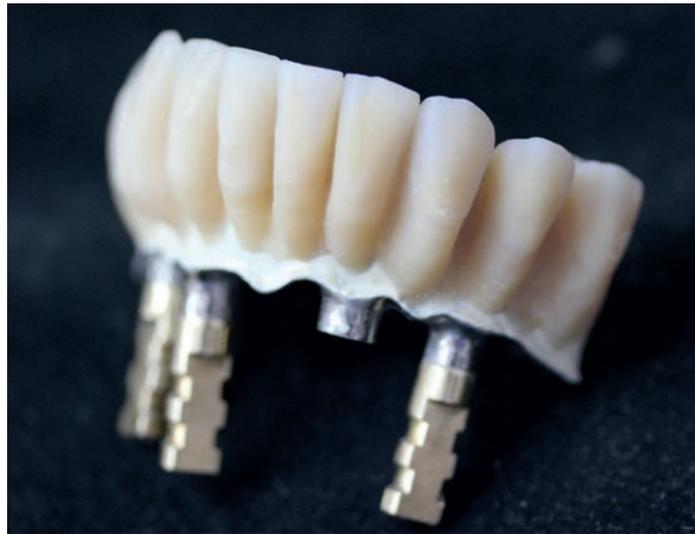


Figure 15: We trim back the Crea.lign to prepare for a build-up of pink Crea.lign gum work



Figures 16-18: We layer the gum work to get the desired aesthetic result

Once this check has been carried out, the facings are back filled with graduated shades of crea.lign to give the depth and specific shading required for the case (Figure 13 -14).

Using this technique we can eliminate the need for surface staining as all shading is integral to the restoration.

Once happy with the crea.lign build up of the teeth, we trim back the crea.lign to prepare for a build up of pink crea.lign gumwork (Figure 15).

We then proceed to layering the gum-work to get the desired aesthetic result (Figures 16 -18).

We then finish and polish the teeth and gum-work to get the desired final result. (Figure 19-24)

Finally

We have had some very encouraging feedback on the cases we have restored using this fantastic new material, especially on cases where we have needed to make alterations after the prosthetics have been fitted.

We can achieve incredible aesthetic results, provide a restoration that can easily be altered or repaired in situ, and when the time comes, can be completely stripped back and remade

giving a completely new aesthetic appearance whilst still using the original framework.

I am conscious that this whole article could come across as a promotion for visio.lign, but when something this exciting comes along you simply can't help but share it with the rest of the dental community.

For more information on visio.lign and a video of another case we produced you can visit us at www.ambridgeceramics.com/products and click on the visio.lign link or contact Bredent.



Figures 19-24: We finish and polish the teeth and gum work to get the desired final result

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Q1.) What three properties does visio.lign offer?

Q2.) Although porcelain offers a fantastic aesthetic result, what problems may occur if underlying occlusal issues are not identified and addressed?

Q3.) Name two benefits that Viso.lign has due to its layering technique?

Q4.) Name 3 of the 5 keys to the strength and bond that comes from Combo.lign:

Q5.) What is said to be the biggest benefit of the Viso.lign?

Q6.) The set-up is scanned and the framework designed to provide sufficient space but what is also provided for the layering material?

Q7.) Why is it not advisable to strip off the ceramic and reuse the original framework?

Q8.) What could cause acrylic cases on implant beams to crack in half?

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Signed:

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