Sunny prospects: Using power to achieve brightness

The layering concept using IPS e. max Ceram power materials

By Bastian Wagner, Germany

The most important factor when imitating the light-optical properties of natural dentition is brightness. It is important to be able to control this factor selectively during the production of the ceramic restoration. The new power materials in the IPS e. max Ceram range allow the dental technician to be the maestro of brightness.

The working routine in the dental laboratory and dental practice has changed a lot in recent years. Co-operation between dentist and dental technician has become multifaceted and complex. This enables the patient’s individual needs to be fulfilled on an even higher level. A prosthetic treatment plan is still an essential and individual needs to be fulfilled on an even higher level. A prosthetic treatment plan is still an essential and functional perfection should be adapted to the individual need and requirements of the patient. For this, it is essential to become familiar with the material properties of the various different materials and know the specific features of the respective ceramic range. For example, it is advisable to make individual shade samples so that the light-optical properties of the ceramic material can be seen. The materials to be used should be ideally coordinated with one another in terms of biocompatibility, stability, aesthetics, processing, chroma, brightness value and hue. This article is an introduction into the new IPS e.max® Ceram power materials. The new ceramic material’s indications and advantages will be presented using a patient case as an example.

The power concept

The well proven IPS e.max Ceram range has been extended with the Power Dentin and Power Incisal materials. The new power ceramic materials have a higher brightness value. The IPS e.max Ceram range now includes three different brightness values and small variations of opacity and chroma. A comparison shows that the dentin materials have the lowest brightness value and that the new IPS e.max Ceram power materials enable the highest values to be achieved. In particular, a wider spectrum is available for creating a specific esthetical reproduction in a single-tooth restoration.

The power materials are specifically designed for the following situations.

- Reproducible natural brightness on translucent frameworks.
- Controllable brightness.
- Vibrant alternating layering to imitate natural teeth with a high brightness value.
- Stable value in this layering thicknesses.

The patient case

One of the biggest challenges for the treatment team is the reconstruction of minimally invasive prepared anterior teeth. This situation requires a great amount of attention from the dental technician. There has to be a high level of understanding for the light-optical analysis of natural teeth and the ability to implement this in ceramic in an individual layering concept. In order to achieve an esthetically harmonious restoration, it is imperative to understand the light-dynamic characteristics of the respective ceramic range. The power ceramic materials widen the selection range and with their high brightness value, they represent a clear added value to the IPS e.max Ceram range. The brightness value can be controlled significantly better. The dental technician can adjust the brightness throughout each of the various steps.

The versatility of the enhanced ceramic range is shown through a patient case. In this case, the patient’s two upper anterior teeth were to be restored with ceramic veneers (Fig. 1). The plan was to esthetically improve both the tooth shade and shape. The natural teeth were prepared using a minimally invasive technique. This created space for the ceramic veneers.

Determining the shade

After a joint analysis of the initial situation and desired target, the tooth shade and the light-optical characteristics were assessed. The shade guide from the respective ceramic range is important for determining the shade (lum), colour saturation (chroma) and colour brightness (value). The preoperative shade analysis showed a high brightness value in the body area of both teeth. The ceramic materials, which were selected through the shade determination, were set in an individual layering concept. Figs 2 to 4 illustrate the importance of targeted shade analysis with photographic documentation.

The power ceramic materials are especially well suited for tooth shades with a high brightness value. They make the reconstruction of young or bleached teeth easier. The advan-
tages of the power ceramic materials can be seen in this minimally invasive situation.

If the brightness value cannot be helped by the framework material, it is all the more important to use a high value ceramic. A “grayness” within the restoration is therefore prevented. A gray shimmer can occur for example, when a translucent framework material is used or in situations where no framework is required.

**Producing the veneers**

In order to esthetically restore the anterior teeth, the veneers were individually built up on refractory dies (Figs 5 and 6). In this case, the prepared teeth have a slight discoloration, which needs to be masked by the ceramic layer. The high degree of reflection (value) made it possible to achieve the required brightness in a minimal layer thickness. Effect materials were used in the build-up to achieve a vibrant appearance. This way, the natural light-optical characteristics were imitated (Figs 7 to 9). An alternating layering concept, using the Power Incisal and the conventional incisal ceramic materials from the IPS e.max Ceram range, gave the ceramic veneer a very high light-dynamic effect with relatively little effort (Fig. 10). The interaction of the different brightness values created a natural in-depth effect within a minimal layering thickness (Figs 11 to 13).

**Conclusion**

To create a harmonious shade reproduction of natural teeth, it is important to imitate the information obtained during shade analysis using the light-dynamic characteristics in the material. The most important characteristic is the brightness (value). If this is not implemented exactly, even a non-professional will see the ceramic restoration at a short speaking distance. If the value is too high, the restoration will appear to be too white; if the value is too low, the restoration will seem too grey.

It is important for the dental technician to be able to influence the brightness value of a veneer. This requires suitable ceramic materials and a patient-oriented working method. The new IPS e.max Ceram power materials are a big plus in everyday laboratory life when translucent framework materials are used and with minimally invasive restorations. The brightness value can even be altered at a later stage with these materials, e.g. if the try-in shows that the brightness has to be increased. This gives the dental technician a high degree of safety, because improvements are easy to achieve. A total remake of the veneer due to correction of the brightness can be avoided in many cases.

The power ceramic materials offer more safety in imitating the brightness value of natural dentition.

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**Fig. 7 & 8:** Alternating the layers with the materials chosen during shade determination

**Fig. 9:** Prepared for the second firing

**Fig. 10:** The veneers with a high light-dynamic on the model

**Fig. 11 & 12:** Veneers on the UR 1 and UL 1: The brightness value of the adjacent teeth has been reproduced exactly. There is a natural in-depth effect within a minimal layering thickness.

**Fig. 13:** Harmony in shade and shape: Both upper anteriors appear significantly stronger and have the desired lighter tooth shade.
Interview: “I try to bring dentists and technology together”

By Nathalie Schüller, DTI

3DMMME provides guided surgery software developed for dentists, radiologists and dental technicians for the complete management of the digital dentistry workflow. The company’s offices, manufacturing facilities and training centre are located in Cantù, Italy. In this interview, CEO Alessandro Motroni talks about the program, training users and the possibilities the software offers.

Mr Motroni, your software analyses and replicates in 3-D complete parts of the body to operate on bone, soft tissue, muscles, and vascular parts. Can you tell me more about it?

We focus on dentistry because of the technology allowing us to mix printing and CAD/CAM, and put all the technology available together to plan the digital workflow. With the latest version of the software, we use the cloud to bring all the team members of the planning process (technicians, dentists, laboratories) together in the same loop through mobile technology as well, allowing the dentistry team to plan on a mobile phone or an iPad, share the project, chat on the same application and produce the surgical guides, models and results with the possibility of being continuously in touch with one another. It is therefore much easier compared with standard software versions for which you need to have a computer, and many dentists hate computers.

There is an issue of safety concerning putting personal information in the cloud. It is said to be secure and then one reads about hackers accessing what are believed to be some of the safest websites. How does the older generation feel about putting information in the cloud using your applicaton?

They are open to it because it is certified as a Class II medical device. We invest a lot of time showing potential customers at major events, such as congresses, what we are doing and promoting the software on social networks.

It has become a new world, one where one’s social media presence is primary. Definitely! We sell in 18 countries, including India and Chile, countries where access to the Internet is not easily available to everyone. We use traditional distribution channels as well.

We also customise the software for companies. We now offer a special service for companies: connecting the project with their ERP [enterprise resource planning] or CRM [customer relationship management] systems so that the integration between the software and the internal ordering or management system runs smoothly. For the dentists, it becomes easier for an order to be placed and facilitates the connection with the sales force. One data set is in the cloud and shared with all the people who work with and need this data. You do not have to enter the data all the time or wait for the order and input it manually, which of course brings with it the possibility of mistakes. Furthermore, each time you have to do something manually, you lose time, and time is money.

We are now waiting for US Food and Drug Administration approval for the software because it is certified as a Class II medical device. We invest a lot of time showing potential customers at major events, such as congresses, what we are doing and promoting the software on social networks.

The word is spreading fast, we have a lot of followers on Facebook. When we have something new, our followers start sharing the information and we receive requests from dentists in Russia, China, etc.

It is quite mind-boggling. Of course, you cannot go against evolution and technology, but considering the pace of development the Internet has fostered, the possibilities it creates, it is a wonder we can keep up.

What will come next do you think?

It is so true. For example, the mobile version allows things never before possible. The dental may be in Rome, the dental technician in Milan, and the implantologist in Venice, yet they can all work on a case without ever meeting. One might think it is something bad, but I think it increases the connection they have because the dentist in Rome might not have been able to manage the case alone.

Thank you very much for the interview.
Dental Technician Int’l Meeting

Joint meeting with
14th CAD/CAM & Digital Dentistry Conference & Exhibition

Save the date
12 April 2019

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