

# Using power to achieve brightness

Bastian Wagner<sup>1</sup>

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 work 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, which enables the patient's individual needs to be fulfilled on an even higher level. A prosthetic treatment plan is still an essential and fundamental factor. Contact with the patient is of great importance for the dental technician, in order to ensure a high-quality result. In addition, the dental technician should be a master of his/her craft and be able to understand the anatomical, functional and esthetic factors of natural dentition.

## Working with all-ceramic materials

Another important aspect for successful prosthetic treatment is the use of appropriate materials. In modern dentistry, permanently fixed restorations made entirely from all-ceramic material are highly relevant in the clinical routine. The ceramic layering materials and the multitude of framework materials available on the dental market offer a wide range of choice for a successful treatment concept – according to the different indications and the respective cases. However, due to the wide variety of products it is not always easy to select the best material. The dental technician's job is to produce prosthetic restorations that have a long service life. Functional, biological and esthetic perfection should be adapted to the individual needs 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



Figure 1: Starting situation. The upper right 1 and the upper left 1 are to be restored with veneers.

<sup>1</sup> Bastian Wagner  
Implaneo dental ceramic  
Richard-Strauss-Strasse 69  
81679 Munich  
Germany  
wagner.zahntechnik@gmail.com



Figure 2: Determining the basic tooth shade.



Figure 3: Determining the light-optical characteristics with a special shade sample (in this case Opal Effect materials).



Figure 4: Determining the tooth shade of the prepared teeth.

ideally coordinated with one another in terms of biocompatibility, stability, esthetics, processing, chroma, brightness value and hue.

This article is an introduction to the new IPS e.max® Ceram power materials. The new ceramic materials' indications, versatility 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 to include the Power Dentin and Power Incisal materials. These new power ceramic materials have a higher brightness value and now include three different brightness values and small variations of opacity and chroma.

Dentin	→	Deep Dentin	→	Power Dentin
-		Value (brightness)		+

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 thin layering thicknesses

### Patient case

One of the biggest challenges for the treatment team is the reconstruction of minimally invasively 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.

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 (hue), 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



Figure 5: Geller model with refractory dies.



Figure 6: Building up the veneers for the first firing.

were selected through the shade determination, were set in an individual layering concept. Figures 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 as they make the reconstruction of young or bleached teeth easier. The advantages 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 "greyness" within the restoration is therefore prevented. A grey 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 discolouration, 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



Figure 7 and 8: Alternating the layers with the materials chosen during shade determination.



Figure 9: Prepared for the second firing.



Figure 10: The veneers with a high light dynamic on the model.



Figure 11 and 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.



Figure 13: Harmony in shade and shape: Both upper anteriors appear significantly stronger and have the desired lighter tooth shade.

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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