Firsthand Experience With Polychromatic LS2 ingot... 
IPS e.max Multi... because it works

By Alham Farah

Polychromatic lithium disilicate pressing ingot—IPS e.max Press Multi. The 400MPa ingots feature a graduated level of shade and translucency, with chroma and opacity higher in the cervical and dentin regions, and more translucency in the incisal areas.

Here under I am sharing with you my firsthand experience on this ingot, from a material and technology point of view, before deciding whether it's your material of choice to use in a real clinical case or not, you need to experiment the optical properties, and learn how to handle the masking, shade matching and color dimensions, and how to get the best esthetic results out of it.

Here I decided to choose a unique feminine smile of beloved celebrity (Imogen Poots), and try to mimic it using a combination of our new IPS e.max press Multi ingot BL2 (for centrals & Laterals) AND the traditional IPS e.max press ingot LT BL2 (for Canines and 1st premolars).

Horizontal sprueing technique - From a (Mesial-Distal) angle of view.
We align the more narrow side of the Wax Pattern Sprue with the occlusal or incisal area of the waxup. For the labial surface of our wax restoration to be always parallel to the Wax pattern Sprue surface, so the ceramic flow path is not directed toward the die. This eliminates lateral pressure on the investment die.

- From a (Labial) angle of view.
We align our wax restoration vertically with the center of the Wax Pattern Sprue. The long axis of the Wax Pattern Sprue to be parallel to the long axis of the restoration; this way, the material layers (Dentin-Incisal) maintain their horizontal relationship during pressing. (Fig 3a.)

Controlling translucency ratio
The ability to manipulate the sprued restoration on the sprue base is a fabulous option to control translucency level. If more translucency is desired, the restoration and Wax Pattern may be lowered by up to 2mm Max, by cutting a small notch from the wax pattern, in order to reach more incisal portion from the ingot to the pressed restoration. (Fig 4.)

From the natural teeth in the picture we notice high level of translucency in the incisal third of the two centrals which do not exists in the two laterals, what required lowering the position of the centrals so more incisal layer will reach the pressed restoration from the Multi ingot, however the positioning for the two laterals kept the same according to the instruction for use for pressing IPS e.max Multi from Ivoclar Vivadent. (Fig.6.)

Canines and 1st premolars were sprued vertically in the traditional way of spruing the IPS e.max press and prepared in another ring base to be pressed later. (Fig 7.)

In a close comparison between the conventional IPS e.max Press (low translucency) ingot and IPS e.max Press Multi, I noticed the following remarks:
1. The dentine layer exists in the Multi is equivalent to the one in LT ingot, maybe the masking capability is even a little better, especially after testing the centrals on ND1 & ND2, they maintained the same shade brightness they have in BL2 shade tap with no ND influence. (Fig.11.)
2. The thickness played an important role in boosting the brightness level and positioning the final shade in between the BL2 & BL1. (Fig.11.)
3. The incisal layer exists in the
Team players: efficiency and esthetics

Modern zirconium oxides fulfil three major requirements of contemporary dental technology: high strength, esthetics and efficiency. The author describes the fabrication of monolithic posterior tooth restorations with the translucent zirconium oxide Zenostar Zr Translucent.

By Dieter Knappe

This article is written in celebration of zirconium oxide, a material which has firmly established itself in the dental laboratory over the past 15 years or so. If appropriately used, zirconium oxide restorations produce very strong and durable results. They also satisfy demanding esthetic requirements due to their translucent properties. The following case study shows how monolithic zirconium oxide is effectively incorporated into the dental manufacturing chain to produce highly esthetic and effective dental restorations without having to compromise on esthetics. In the case presented, a wax-up was crafted which served as a basis for fabricating a provisional restoration (Telio® CAD for Zenotec, Wieland Dental) and a permanent restoration (Zenostar Zr Translucent, Wieland Dental) with one digital data set and CAD/CAM milling equipment.

Preoperative situation

The patient presented to the dental practice with a fractured ceramic inlay restoration in tooth 26 which she wished to have replaced. The tooth had been restored many years previously. Since tooth 25 and tooth 55 were discoloured as a result of root canal treatment, they were included in the treatment plan. The existing tooth structure of tooth 26, which had been prepared to accommodate the inlay in the past, was preserved to the best possible extent. The patient had very high esthetic expectations and wanted the explicit assurance that the crowns would look completely natural. Nonetheless, we decided to use a very efficient fabrication method in which monolithic restorations are produced with translucent zirconium oxide (Zenostar Zr Translucent). Three options are available for fabricating monolithic restorations with this approach:

1. milling, sintering, glazing (efficient, cost-effective);
2. milling, sintering, individualization with ceramic characterization materials, glazing;
3. milling, individualization with infiltration liquids, sintering, glazing (highly esthetic).

We chose to pursue the third method, which would be very cost-effective as a result of the benefits offered by the digital workflow.

Advanced zirconium oxide

Zirconium oxide is more than twice as strong as other dental ceramics, and it exhibits excellent mechanical properties. Due to its translucent characteristics, the material has been fulfilling highly esthetic requirements for quite some time now. The material is used to fabricate full-contour (monolithic) restorations and frameworks that provide a base for individualized veneers. The zirconium oxide material Zenostar Zr Translucent shows excellent light transmission. In this system, efficiency teams up with esthetics to offer impressive results. The wide range of discs, the matching stains and the brush infiltration technique allow lifelike effects to be imparted to restorations in a relatively short time.

Preparation

The following aspects were paramount in preparing teeth 25, 26 and 26 for the ceramic restorations: avoidance of sharp edges and observation of a minimum wall thickness. The benefits of using zirconium oxide include the material’s high strength and as a consequence, the fact that very little tooth structure needs to be removed. The cavity in tooth 26 already showed evidence of periodontal disease that had to be treated. In order to properly anchor the new restoration, pre-preparation of the new restoration, re-preparation was shown to be inevitable. The cavity had to be extended towards the buccal aspect. Despite being very thin, the buccal cusp walls were in an acceptable condition. The main objective was to maintain the tooth by restoring it with a crown. Following the preparation phase, impressions were taken of the upper and lower jaws and the occlusal relationship was established. Then, the clinician fabricated the provisional restoration chairside with the help of a customized tray.

Fabrication of long-term temporaries

According to the treatment plan, the patient would have to wear long-term temporaries for a period of several months. In order to fabricate these restorations, a
Fabrication of the permanent restorations

Three months later, it was time to focus on the permanent restorations. In an effort to keep the treatment with monolithic restorations as straightforward as possible, the existing data set, which had been validated by means of the long-term temporary, was used (Fig. 7). We selected the translucent zirconium oxide Zenostar Zr Translucent for the restorations. This material comes in disc form and is available in six different shades. We decided to use the “sun” variant, which would give the restorations a warm, reddish foundation. Variations in the thicknesses of finishing the restoration were available after the milling process (Zenotec Select) (Fig. 8). In this case, the unsintered structures were characterised with the colour infiltration method.

Finishing: brush infiltration

In the brush infiltration, the milled structures (crown cores) were infiltrated with a colour liquid (Zenostar Color Zr, Wieland Dental). In this process, the restorations acquire a lifelike appearance, showing a tooth-like characterisation of the natural teeth. Therefore, it offered the ideal basis for reproducing the optical properties of the natural teeth. The described approach will help to satisfy the rising number of cost-conscious and esthetically demanding patients, since it offers an attractive alternative to individually layered ceramic crowns and cast crowns made of precious or non-precious metal.

Microcracks are prevented by reducing the grinding work to a minimum.

At this stage - before the staining materials were applied - the zirconium oxide crowns were polished and the surfaces were smoothed (Fig. 12). This effectively counteracted the common concern of abrasion.

After the crowns were fired, a glaze (Zenostar Magic Glaze, Wieland Dental) was sprayed on their surfaces in order to establish an even base for the application of the staining materials. Stains in paste form (Zenostar Art Module Pastes, Wieland Dental) were used to characterise the restorations. The pastes had to be mixed to a soft, smooth consistency before they could be applied. The cervical and incisal areas of the restorations were individualised with the stains (Fig. 15). A film of glaze was sprayed on the restorations (Fig. 14) before they were fired. The combination of the stains and the lightly fluorescent spray glaze produced a three-dimensional effect.

After the final firing, the crowns did not appear any different from layered restorations. On the contrary, they looked very lifelike and showed a natural internal play of colour. In the next step, the occlusal contacts were checked in the articulator and the proximal contacts on the model. Then the crowns were sent to the dental practice for placement.

Seating of the restorations

Teeth 25, 35 and 26 were suitably prepared for the permanent restorations. Unfortunately, the attempt to save tooth 26 failed. The buccal crown wall fractured when the long-term temporary was removed. Right from the beginning, we were aware of the fact that the remaining part of this tooth might not be strong enough to withstand the treatment. At this stage, it became quite clear that the tooth could not be preserved. Consequently, the long-term temporary was re-seated and a new treatment plan was presented to the patient for tooth 26 on the basis of a detailed analysis. A few weeks later, the permanent all-ceramic crowns were cemented (SPEEDCEM®) on tooth 25 and tooth 35. The plan was to replace tooth 26 with an implant-supported restoration at a later date.

Conclusion

The monolithic zirconium oxide crowns on tooth 25 and tooth 35 were indiscernible from the other teeth (Figs 15 and 16). The patient reported that she was able to chew comfortably and naturally. The CAD/CAM fabrication protocol allowed the crowns to be cost-effectively produced. The translucent material (Zenostar Zr Translucent) that was used in this case showed a high level of light transmission. Therefore, it offered the ideal basis for reproducing the optical properties of the natural teeth.

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inLab MC X5: Open 5-axis production unit for dental laboratories

By Sirona

inLab MC X5, the five-axis milling and grinding unit was newly developed especially for the demands of dental laboratories, completes Sirona’s inLab system. Dental technicians benefit from the greatest flexibility for the entire production process of esthetically pleasing restorations and the largest selection of materials available on the market.

Developed especially for dental laboratories

“The new laboratory unit sends a clear signal from Sirona to dental technicians,” says Reinhard Pieper, Director of inLab Product Management at Sirona. Users benefit from 30 years of experience with CAM/CAM in wet processing of various materials combined with new dry processing techniques – in one machine. “We implemented all of our know-how as a pioneer and innovation leader of dental CAD/CAM technology to develop a CAM/CAM laboratory machine tailored specifically to meet existing and future demands,” added Pieper. “This ensures that inLab MC X5 will be a good investment in the long term.”

inLab MC X5 is Sirona’s first open production unit and is suitable for use with various existing CAM/CAM equipment in dental laboratories – for users with a Sirona scanner and inLab software or for laboratories with scanners and CAD components from other manufacturers. STL restoration data can be imported easily and quickly to the CAM software module developed for inLab MC X5 and processed with inLab MC X5. In combination with the inFlow X5 scanner and inLab software, the new laboratory machine is the optimal complete solution for new users of Sirona CAD/CAM production.

Productive laboratory unit for all common processing jobs

Depending on the indication and material, the five-axis inLab MC X5 can be used for wet or dry processing. In addition, for the first time it is possible to switch automatically from dry to wet processing when working on one part. Tools used include carbide cutters and diamond grinders as well as standardized disks with a diameter of 98.5 millimeters and a height of up to 50 millimeters. Users can ensure efficient utilization of material by using the disk management function and extensive nesting functions. The especially developed multi-block holder uses CAD/CAM materials in block form. It can be loaded with up to six blocks of different materials at the same time.

inLab MC X5 is thus designed to be a uni-versal laboratory unit for a number of indications and for processing zirconium oxide, polymers, composites, wax, glass ceramics, hybrid ceramics, and prepared for metals. The machine allows the dental laboratory a free choice of all materials and it benefits additionally from the material competence of Sirona’s material partners VITA Zahnfabrik, Ivoclar Vivadent, Dental, 3M ESPE, and GC.

Open, user friendly, and cost effective

Thanks to the combination of the wide range of indications, free choice of materials, and open interfaces for external restoration data, dental technicians can use the machine flexibly from the start. The high-quality, functional design of the chamber of the la-boratory unit ensures easy maintenance and makes it fast and easy to clean with the specially developed “easy-clean” concept. It can quickly switch among various materials and between wet and dry processing. This flexibility combined with the reasonable cost and the fact that there are no additional dongle fees makes inLab MC X5 very cost effective. The unit is delivered with its own inLab CAM software module and can be ordered from dental dealers immediately.

Experience new freedom in your lab processes breaking the chains of former dependencies with inLab and the new 5 axis milling and grinding unit inLab MC X5. Open for all restoration data, combining the largest material range and the possibility to machine both wet and dry disks and blocks – for no limitations to your production.

Enjoy every day.

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