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 hol- lowed 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 parallal 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 fulfill 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 digital 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 (Teledyne CAD for Zeramex, 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 35 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 (esthetic, cost-effective);
2. milling, sintering, individualization with their translucent properties;
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 aesthetic 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 27 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 extensive preparation. However, in order to properly anchor the new restoration, re-preparation was performed of 400MPa, the material is indicated for anterior and posterior crowns, veneers and hybrid abutment crowns. The ingots are available in one size and in the following shades: A1, A2, A3, A3.5, B1, B2, C1, C2, D3 and BL2.

I advise using this solution for upper and lower centrals and laterals, where translucency level and esthetic is high, but strictly when the labial preparation thickness is 1 mm and up, for the graduated level of shade and translucency in the ingot to be visible. I was intuitive to try the bleaching shade out of the full shade range intentionally, because I believe this ingot will solve the grayish problem generated by layering enamel powder on any bleaching color. And it really worked.

Conclusion

Ivoclar Vivadent’s new IPS e.max Press Multi is a real innovation in the pressing technology pyramid, for fabricating esthetic and multi-dimensional monolithic restorations with out cutback or layering in most of the cases; because esthetic results are achieved in a single press sequence with subsequent glazing. The ingots feature a graduated level of shade and translucency similar to that of natural teeth. With a strength of 400MPa, the material is indicated for anterior and posterior crowns, veneers and hybrid abutment crowns. The ingots are available in one size and in the following shades: A1, A2, A3, A3.5, B1, B2, C1, C2, D3 and BL2.

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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
The waxed up crowns were transformed into long-term temporaries with CAD/CAM equipment. First, the physical models and wax-ups were digitally scanned (Zenotec D500, Wieland Dental) and the STL files were imported into a corresponding design software (Dental DesignerTM, 3Shape) (Fig. 5). Then, all the parameters were suitably adjusted and the construction data was transferred to the milling machine (Zenotec select, Wieland Dental), where the restoration was cut from a PMMA-based die (Telios CAD for Zenotec) (Figs 4 and 5). The milled crowns were re-worked only minimally and then placed on the model. In order to impart the PMMA restorations with a natural-looking appearance, their surface texture was finished in such a way that a natural play of light was achieved. The crowns were subsequently polished with a special polishing medium and goat’s hair brushes (Fig.6a). Next, the clinician removed the chairside provisional restorations and cemented the long-term temporaries with a suitable luting composite (Telio® CS Link) (Fig. 6b). 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 the long-term temporaries, was used (Fig.7). We selected the translucent zirconium oxideZenostar Zr Translucent for the restorations. This material comes in disc form and in six different shades. We decided to use the “sun” variant, which would give the restorations a warm, reddish foundation. Various possibilities of finishing the restoration were available after the milling process (Zenotec select) (Fig. 8). In this case, the unsintered structures were characterized with the colour infiltration method. Finishing: brush infiltration In the brush infiltration, the milled structures (crown cores) are infiltrated with a colouring liquid (Zenostar Color Zr, Wieland Dental). In this process, the restorations acquire a lifelike appearance, showing a tooth-like progression of shade, already before the sintering procedure. All the A-D shades can be reproduced with these colouring solutions. Five additional characterization stains are available. In this process, the hair joints were removed from the milled crowns 26, 25 and 55 by grinding, and the surfaces were smoothed (Figs 8a and b). Subsequently, the colouring liquid is applied on the cusps tips and in the fissures (Fig. 9a and b). The restorations were polished and the surfaces were smoothed (Figs 9a and b). The unsintered structure is carefully ground and smoothed. Microcracks are prevented by reducing the grinding work to a minimum. The crowns appeared 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 bucal 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 (SpeerCEM®) 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 55 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 (Zenotec 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. The described approach will help to satisfy the rising number of cost-conscious and esthetically discerning patients, since it offers an attractive alternative to individually layered ceramic crowns and cast crowns made of precious or non-precious metal.
inLab MC X5: Open 5-axis production unit for dental laboratories

By Sirona

InLab MC X5, the five-axis milling and grinding unit 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.

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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The Dental Company

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 CAD/CAM in wet processing of various materials combined with new dry processing techniques – in one machine. “We implement all of our know-how as a pioneer and innovation leader of dental CAD/CAM technology to develop a CAD/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 CAD/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 inLab 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 pro-cressing 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 specially 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 pro-cressing zirconium oxide, polymers, composites, wax, glass ceramics, hybrid ceramics, and prepared for metals. The machine allows the dental laboratory a free choice of all material suppliers and it benefits additionally from the material competence of Sirona’s material partners VITA Zahnfabrik, Ivoclar Vivadent, Dentsply, Merz 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 lab-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.