Achieving a nuanced interplay of colours in four easy steps

Processing the polychromatic IPS e.max Press Multi ingot

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For sometime, Ivoclar Vivadent has been offering a polychromatic, that is multi-coloured, ingot for the press technique: the IPS e.max Press Multi ingot. These innovative ingots integrate a smooth shade progression. Nuanced shade gradients from the enamel to the dentine allow multicoloured restorations to be pressed in a single sequence. The polychromatic press technique is surprisingly simple, as can be seen below.

The press technique is a proven method for creating monolithic all-ceramic restorations in the dental laboratory. Many technicians enjoy the efficient procedure that allows them to choose between using their artistic manual skills or the digital wax probe, depending on their preference. Impressively accurate results can be achieved, especially in conjunction with lithium disilicate glass-ceramics (IPS e.max Press). Exact processing parameters are needed to achieve a high level of translucency in the incisal region. The IPS Multi investment ring base has been especially designed for the polychromatic press procedure.

The Multi ingot enhances the family of the proven IPS e.max Press lithium disilicate materials. It is supplied in two A- or B-shades and a shade platelets, are utilised for sprueing. The IPS Multi Investment Ring Base has been especially designed for the polychromatic press procedure. The marginal areas should not be over-contoured to avoid the need for time-consuming and risky adjustments. It should also be borne in mind that the restoration will be characterized with stains and/or glaze after the press procedure and may therefore slightly, but only just slightly, fall short of the stipulated thickness in the occlusal area.

Investing

The Multi ingots are clearly more chromatic in the lower area than in the upper third. This gradation follows the gradation found in natural teeth. The question arises as to how the shade layers of the ingot can be transferred to the restoration so that they are positioned in the correct place. From this perspective, the procedure is different from the conventional press technique. A special wax-up technique and processing accessories have been developed for the polychromatic press ingots.

The wax-up object is laterally sprayed on the investment ring. In contrast to the conventional procedure, no wax sprues are used. Instead, prefabricated precision wax parts (IPS e.max Press Multi Wax Pattern), which resemble small wax platelets, are utilized for sprueing. Depending on the restoration, either Form A or B is employed. Form A is indicated for large wax objects, such as maxillary anterior crowns (Fig. 2a), and the smaller Form B for delicate restorations (Fig. 2b). After the appropriate size has been chosen, the Wax Pattern is sprayed to the wax-up. The wax-up restoration should be left on the model die while spraying to avoid damaging the restoration margins. A drop of wax is applied on the side of the Wax Pattern without altering its geometry. The conical side of the Wax Pattern is aligned towards the incisal area of the wax-up and the wax-up is carefully pressed against the wax. It is recommended to align the wax-up to the centre of the Wax Pattern in the investment ring. Since the shade gradation of the Multi ingot should be transferred to the visible part of the restoration, the vestibular surfaces of the wax-up have to be aligned accordingly. Posterior crowns are sprayed on the mesio-buccal surface. Finally, the gap between the Wax Pattern and the wax-up is closed with a small quantity of modelling wax.

The IPS Multi Investment Ring Base has been especially designed for the polychromatic press procedure. The Multi investment ring contains four openings, which are congruent with the shape of the IPS Multi wax platelets. As a result, the sprayed wax-up can be accurately positioned in the investment ring base (Fig. 3a). A drop of positioning wax is applied into the openings to be used. The Wax Pattern is then inserted into the investment ring base. Unused openings in the investment ring base are sealed with wax. Another accessory of the IPS Multi system then comes into play: the IPS e.max Press Multi Sprue Guide. Similar to a template, the Sprue...
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Guide is held against the loaded investment ring to check the correct sprueing (Fig. 5). The wax-up to be pressed should be positioned within the marked area. The distance to the investment ring base must not be less than 3 mm (Fig. 6).

The investment materials (IPS PressVEST or IPS PressVEST Speed) are applied using a conventional method. Once mixed, a small quantity of investment material is brushed on to the occlusal surface and/or on to the screw channel of hybrid abutment crowns, and the insides of the crowns are filled with investment material using a suitable instrument to prevent air from being trapped. After the IPS Silicone Ring has been placed on the investment ring base, the investment material is slowly poured into the investment ring up to the marking on the silicone ring. The IPS Investment Ring Gauge is positioned with a slightly hinged movement and then pressed into position. The investment material is allowed to set in a resting environment (Figs. 7a–c). Once set, the investment ring is preheated using a conventional method.

Pressing

The IPS e.max Press Multi system includes the IPS e.max Press Multi One-Way Plunger, a single-use plunger, which is used in addition to the IPS e.max Alox Plunger. With the appropriate programme having been selected on the press furnace, the cold IPS e.max Multi ingot is placed into the preheated investment ring with the blank side facing downwards. Next, the cold One-Way Plunger and the Alox Plunger are positioned (Fig. 8). The loaded investment ring is placed in the preheated press furnace and the press programme is started. As known from the conventional press technique, the investment ring should be immediately removed from the furnace after the press process has ended and allowed to cool slowly. Divesting is performed in the familiar way. The investment ring is separated using a separating disc and carefully broken apart at the predetermined breaking point (Fig. 9).

Blasting with polishing beads at 4 bar (58 psi) pressure and then at 2 bar (29 psi) is recommended for removing the investment material (Fig. 10). The reaction layer is removed using IPS e.max Press Invex Liquid. The pressed object is immersed in Invex Liquid in a plastic cup, cleaned in an ultrasonic cleaner for 10–30 min and then rinsed under running water. The white reaction layer can then be completely removed with aluminium oxide (100 μm) at 1–2 bar (14.5–29 psi) pressure without leaving any residue (Fig. 11).

Staining

Finishing is performed with grinding tools suitable for high-strength glass-ceramics. Work is carried out at low speed and light pressure. Overheating of the ceramic must be avoided. The restoration is tried in on the die (without a spacer) and the occlusion and articulation are
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The press technology usually transfers even the finest structures to the ceramic. In most favourable cases, filigree fissures, accentuated cusp slopes and macro-textures are reproduced one to one in the ceramic. If preferred, certain macro-textures can be adjusted by grinding to give them additional emphasis. Once cleaned, the restoration shows a smooth shade progression from the cervical to the incisal region and, as a result, the shade of the restoration looks very natural.

**Fig. 11:** Pressed restoration after divesting. The smooth shade progression from the cervical to the incisal area is clearly noticeable.— **Fig. 12 & 13:** Work in progress. The natural shade progression of the two crowns is the result of the IPS e.max Press Multi ingot. If required, the restorations can be additionally customised with stains.

At this stage, the restoration can be prepared for the glaze firing (or optional stain-firing) cycle. IPS e.max Ceram Shades and Essences are used for this step. The procedure is the same for both polychromatic and monochromatic restorations. For better wettability of the stains, a small quantity of Stain or Glaze Liquid is applied to the grooves and contamination-free ceramic surface. The stains are then applied to characterise the restoration according to individual requirements. The characterisations can be intensified by repeating the staining and firing procedure. Even before the stains are applied, the incisal area appears clearly more translucent than the other parts of the restoration. This effect can be intensified by brushing on a small quantity of IPS e.max Ceram Shades Incisal.

If required, the dental technician will customise the restoration. However, this is not desired in all cases, and even without stains, the restoration appears natural and closely resembles a layered crown. Glaze firing is the final step in the procedure.

We recommend using fluorescent glaze material. The glaze is applied in a thin, but covering, coating. If minor adjustments are required after the glaze firing, they may be applied using IPS e.max Ceram Add-On materials.

**Conclusion**

IPS e.max Press Multi affords a streamlined procedure that supports the need for economic efficiency in the dental laboratory and yet does not entail sacrifices in aesthetic quality. What is so delightful about this material is that it allows you to do all, but does not require you to do everything. With or without stains, the restorations exhibit a natural variation of shade and translucency from the dentine to the incisal region. High aesthetics and high efficiency are combined with the proven material properties of lithium disilicate (IPS e.max Press), such as high strength. These properties are incorporated into the IPS e.max Press Multi ingot.

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