

SPECIFIC ARTICLE: ICE ZIRKON

Saga Zirkonia - Zirconia News From The Experts

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Fig. 1: The diagnostic set-up points the way

The extreme Class-II and severely compromised periodontal condition left no other choice but extraction and placement of implants for this patient. With the kind of spectacular solutions in mind which have become commonplace thanks to ZIRKONZAHN, a plan was hatched to deliver the best possible outcome with regards to function and aesthetics.



Fig. 2: FRAME resin duplication of set-up

A light-cured base plate is used for the diagnostic set-up (mock-up frame): Tooth placement for the ideal aesthetic appearance is the primary concern; actual abutment positions are only of secondary importance at this phase.



Fig. 3: FRAME duplicate in situ for checking

The set-up is tried in situ. Fit, function, phonetics and aesthetics are confirmed before the case is full contour duplicated in ZZ Frame, a dimensionally stable polyurethane with high filler content.

The plan is to porcelain-veneer the entire arch. Therefore the individual teeth are 'prepped' to create adequate space for the porcelain layering. The tissue contours are also sculpted for veneering with ZZ Tissue coloured ceramics.



Fig. 4: Screw access channels fixed with DuraLay

For optimal accuracy of fit the mock-up frame had been assembled directly on the fixture heads in situ with DuraLay at try-in. The frame is placed in the milling template, the zirconia block aligned accordingly and milling begins.



Fig. 5: Milling in progress

After milling, the bridge surface is refined, two-tone coloured and pre-dried for an hour. Sintering over-night follows.



Fig. 6: Two-tone coloured frame ready for sintering

Distortion is avoided by leaving the arch attached to its support base and by placing it centered and upright into the furnace firing chamber.



Fig. 7: 'Freshly baked' after sintering

Opening the furnace the next morning is always an exciting experience. One wants to get his hands on the case as soon as the technician's (usually rather heat tolerant) fingers will allow.



Fig. 8: Seated on model

The even and constant shrinkage factor of ICE ZIRKON zirconia married with the elaborate set of styli and milling burs of the Zirkonzahn milling system bears good fruit requiring only minimal touch-up to seat the restoration on the model. Casting a case like this in alloy would be a night-mare by comparison let alone the 'veneering anxieties' which such massive large case in metal would bring.

A zirconia frame that fits, fits - period! No distortion or creep even after five or more firings.



Fig. 9: Zirconia frame try-in

Prior to layering the ceramics a second try-in follows and a final check-bite is taken preferably with a rigid type material. A new opposing imprint could also be taken at this stage to ensure highest accuracy of occlusion.



Fig. 10: Occlusal view

Due to the severe Class-II situ the screw access channels ended up in the vestibule realm in the area of 12 -22 and within the crown-area of 13 and 23. For this reason both canines were kept as single units for separate cementation onto the frame later on.



Fig. 11: Unusual screw access indeed



Fig. 12: Dentin build-up

Seven different tissue shades and a multitude of other ICE KERAMIK colours give the ceramist plenty of opportunity to get creative. Wash-bake done, the porcelain is layered ending with the mamelon outline at full incisal length (compensating for shrinkage). Approximal ridges are built up with T3 (ICE KERAMIK whitish opalescent enamel). A lateral segmental build up with various other enamels completes the form. The tissue areas are also layered at the same time before the bridge is ready for the first bake.



Fig. 13: Approximal ridges in T3, gum areas in TISSUE

Utmost attention must be paid to firing and cooling parameters when dealing with zirconia restorations of this size! A heat rise taken too fast, holding time too short and slow-cooling not observed can compromise if not destroy your efforts. Never fire such cases under time constraints!



Fig. 14: Ready for the 1st bake

Nothing is left to chance. We biscuit-bake-try our case in situ before completion: Final check patient's function and aesthetics. No too much is expected in way of corrections if our preparations have been thorough.

Detail and zirconia-to-abutment fit are astounding - looking at hygiene and cleaning ability the biocompatibility of the mirror-finished base is unquestionable.



Fig. 15: Biscuit bake try-in



Fig. 16: Aesthetics confirmed at try-in stage



Fig. 17: Anteriors after glazing



Fig. 18: View of tissue fitting surface



Fig. 21: Lateral view of complexity and construction

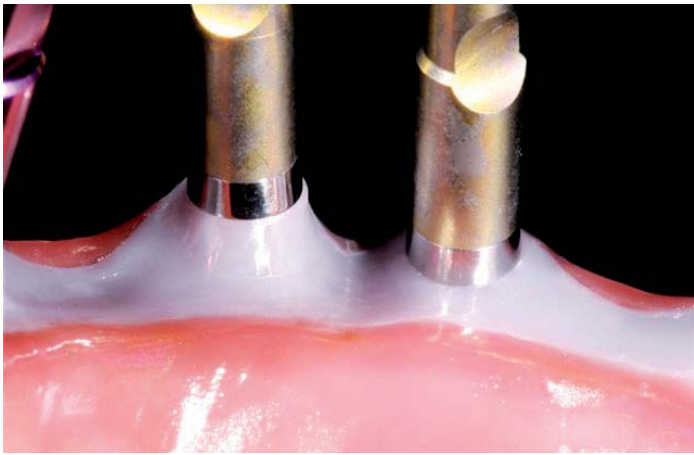


Fig. 19: Convincing fit and polish

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The complexity of the case and its optimal solution become obvious in the lateral view shown.



Fig. 22: Case screw-fastened in situ



Fig. 20: Cleaning ability demonstrated



Fig. 23: Both canines cemented over frame

For the screw access channels plugs are made from pink composite material, kept 'removable' by a thin thread of floss until final placement of the restoration.



Fig. 24: Screw access holes plugged

Everything goes precisely to plan on the great day of issue. All screws are hand-tightened first. No occlusal adjustments are necessary and adaptation is harmonious. Finally all screws are fastened to 35Nm by torque driver. Preferably screw heads are 'locked' with cold-cure acrylic not using a cotton-cushion. The canines are cemented over the frame. The tissue-coloured plugs are fixed with a drop of ZZ-GLUE light-cure liquid resin.

Summary:

With a 'five-axes' manual copy-milling system (that can master angles up to 45 degrees) the "zirconia sky is the limit". The most 'way-out' cases, diverging abutments of all kinds, screw-retained frame work and much more can be milled competently.

All of the above can be realized as both, functional and aesthetically pleasing restorations of highest standard - given the chance we find dentists and technicians who dare ... Antonio is one of them.



This case was milled with the manual ZIRKONZAHN zirconia milling system.

Move the world with your hands!

Antonio Steger