



PARTIAL VENEERING ON ZIRCONIA:
MINIMAL LAYERS,
MAXIMUM AESTHETICS

By DT Ghaith Alousi

MATERIALS USED

KATANA™ Zirconia YML

ZIRCONIA BLANK

High-esthetic multilayer zirconia blank with a natural color gradient from cervical to incisal. Combines high flexural strength with excellent translucency. Ideal for partial veneering.

CERABIEN™ MiLai

VENEERING CERAMIC

New-generation veneering ceramic specifically developed for zirconia restorations. Excellent adhesion to zirconia, natural light optics, wide range of masses for detailed layering techniques.

CERABIEN™ MiLai Internal Stains

STAIN COLORS

Incisal Blue 1, Mamelon Orange 2, A+, Tissue Pink, Salmon Pink, White – all mixed with Bright medium for optimal consistency and application precision.

CERABIEN™ MiLai Masses

CERAMIC MASSES

Tx, Creamy Enamel, LTx, CCV-2, ELT₁ for teeth. Tissue 1, 4, 6 for the gingiva.





INTRODUCTION

The technique represents a modern, efficient approach to dental laboratory aesthetics: rather than voluminous ceramic build-ups, minimal yet precisely applied layers are used, which in combination with the intrinsic aesthetic of the zirconia framework achieve an extraordinary result.

In this case report, dental technician Ghaith Alousi documents step-by-step the fabrication of a facially layered maxillary anterior zirconia restoration based on KATANA™ Zirconia YML and the novel veneering ceramic CERABIEN™ MiLai. The key feature: the palatal surface remains monolithic zirconia, while only the vestibular surface is veneered with CERABIEN™ MiLai. This combines the stability of zirconia with the incomparable aesthetics of a hand-layered porcelain.

STEP 1

ZIRCONIA FRAMEWORK BEFORE SINTERING

CAD/CAM Milling · KATANA™ Zirconia YML · Green State

The framework was deliberately designed for partial labial veneering: the vestibular surface provides sufficient space for the CERABIEN™ MiLai ceramic. While the palatal surfaces are entirely monolithic, the occlusal contact points remain on the mechanically superior zirconia.



Fig. 1: Framework before sintering. Framework after milling.

MATERIAL:

KATANA™ Zirconia YML

KURARAY NORITAKE · ZIRCONIA BLANK

STEP 2

AFTER SINTERING

Sintering · Multi-Layer Aesthetics · Sandblasting

Following the sintering cycle at 1550 °C, the KATANA™ Zirconia YML framework reveals its full multi-layered character. The impressive colour gradient – from a warm, yellowish-cream tone cervically to the cool, translucent incisal edge – is the direct result of the pigment layering integrated into the blank.

The framework was cleaned directly after sintering using sandblasting only (110 µm, 1.5 bar), with no further processing.



Fig. 2: Sintered framework vestibular view – multi-layered colour gradient after sintering.



Fig. 3: Sintered framework - palatal view – monolithic zirconia structure.

PROCESSING:

- Sintering (1550 °C)
- Sandblasting

STEP 3

FIRST STAIN LAYER

CERABIEN™ MiLai Stains · Colour Foundation · Internal Characterisation

Prior to ceramic layering, a differentiated stain layer is applied directly to the sintered zirconia framework. This layer serves as the colour foundation and internal characterisation – defining depth effect and individuality.

Colour distribution by zone:

Incisal: Incisal Blue 1 + Bright 20 % – to simulate the natural opalescence effect.

Mid incisal area: Mamelon Orange 2 + Bright 20 % – to replicate the characteristic mamelon structure.

Cervical area & interproximal: A+ + Bright 20 % – for increased chroma and saturation in the cervical third.

Gingival area: Tissue Pink + Salmon Pink – for natural tissue toning.

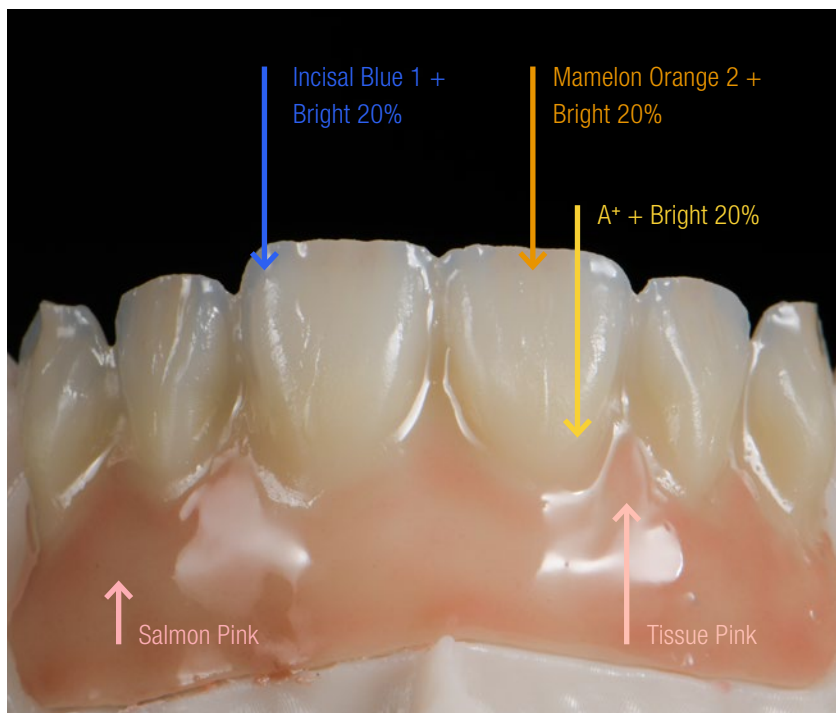


Fig. 4: CERABIEN™ MiLai stains applied – unfired state.

CERABIEN™ MiLai INTERNAL STAINS:

- Incisal Blue 1 + Bright 20 % (incisal area)
- Mamelon Orange 2 + Bright 20 % (mamelons)
- A+ + Bright 20 % (cervical & interproximal areas)
- Tissue Pink (gingiva)
- Salmon Pink (gingiva)

STEP 4

FIRST CERAMIC LAYER & WASH BAKE

TX + Tissue 1 · Bonding Fire · Bond Optimisation

After firing the stains, the first ceramic layer is applied using CERABIEN™ MiLai Tx for the tooth areas and Tissue 1 for the gingiva. The goal is to establish an optimal bond between ceramic and zirconia.

A deliberate wash bake is performed: the firing temperature is raised above the normal reference value so that the ceramic mass flows more readily and bonds optimally to the zirconia surface. A liner or wash fire is intentionally omitted.



Fig. 5: First ceramic layer – unfired, frontal view.



Fig. 6: Frontal view – raw first layer.

CERABIEN™ MiLai MASSES:

- Tx (Translucent) – tooth portions
- Tissue 1 – gingival area
- Firing mode: wash bake (elevated temperature)

STEP 5

AFTER WASH BAKE

Bond Verification · Preparation for Second Stain Layer

The result after the wash bake shows a first ceramic layer fused to the zirconia. The surface appears smooth and uniformly glossy. The Tx layer enhances the intrinsic translucency of KATANA™ Zirconia YML and allows the multi-layer colour gradient to shine through harmoniously.



Fig. 7: After wash bake – Tx and Tissue 1 perfectly fused to zirconia.

STEP 6

SECOND STAIN LAYER – DETAIL CHARACTERISATION

Natural Cracks · White · Surface Individualization

In the second stain layer, the focus is on maximum precision and detail. CERABIEN™ MiLai internal stain White is used to apply fine, naturally appearing crack lines (Natural Cracks) to the tooth surface.

These subtle whitish crack lines develop in natural teeth through enamel stresses and impart to them their unmistakable, vital character. They run anatomically correctly in a vertical direction, varying in intensity and length – exactly as found in nature.

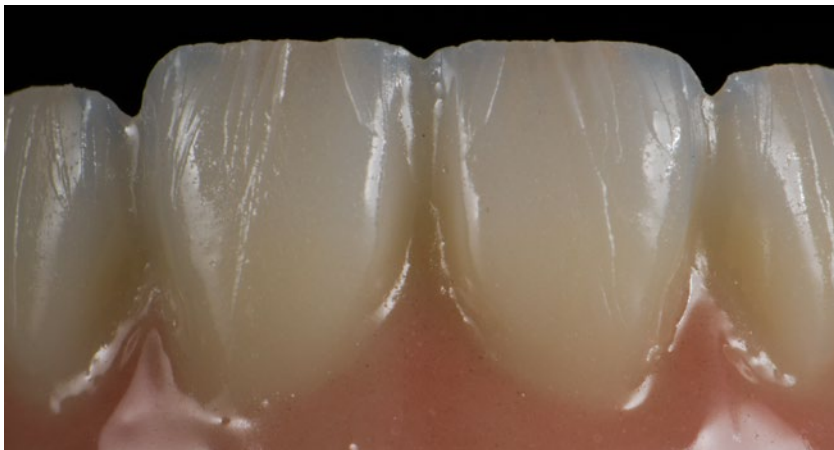


Fig. 8: Close-up – fine crack lines with white stain.



Fig. 9: Second stain overview – harmonious detail distribution.

CERABIEN™ MiLai INTERNAL STAIN:

· White – Natural Cracks / craquelé lines

STEP 7

SECOND CERAMIC LAYER – MAIN BUILD-UP

Morphology · Enamel Masses · Gingival Design

The second ceramic layer requires the highest concentration on **colour, morphology, and surface texture** simultaneously. This is the main build-up, during which the final form of the restoration is established.

Tooth masses – zonal strategy:

Creamy Enamel establishes the warm body tone. **LTx (Luster Translucent)** imparts opalescent vitality. **CCV-2 (Clear Cervical 2)** provides transparent chroma cervically. **ELT₁ (Enamel Luster 1)** completes the incisal zone with a delicate enamel gloss.

Gingival masses:

Tissue 1, 4, and 6 create a differentiated tissue appearance with light, mid, and deep tones.



Fig. 10: Main build-up – Unfired state.

CERABIEN™ MiLai MASSES – TEETH:

- Creamy Enamel – body zone
- LTx (Luster Translucent) – opalescent vitality
- CCV-2 (Clear Cervical 2) – cervical chroma
- ELT₁ (Enamel Luster 1) – incisal enamel gloss



Fig. 11: Main build-up – Close-up – surface texture.



Fig. 12: Main build-up – Close-up – surface texture.

CERABIEN™ MiLai MASSES – GINGIVA:

- Tissue 1 – light, delicate tissue areas
- Tissue 4 – mid gingival tone
- Tissue 6 – depth, shadow, interdental papillae

STEP 8

SECOND CERAMIC FIRING

Not Yet Finished · As-Fired State

The result after the second ceramic firing is already convincing in its raw form. The fired mamelon structures, the fine crack lines, and the differentiated gingival design are clearly visible. The final surface texture and form will be refined in the next step through mechanical finishing.



Fig. 13: After second firing – not yet finished.

STEP 9

MECHANICAL FINISHING

Morphology Refinement · Before Self-Glaze Firing

Mechanical finishing requires artisanal expertise and a trained aesthetic eye. Diamond burs are used to bring form, proportions, and surface texture to their final level.

Special attention is given to surface texture: perikymata, vertical lobule structures, and the cervicogingival transition are individually incorporated. The palatal side remains completely untouched.



Fig. 14: After finishing.



Fig. 15: Finishing, perikymata and surface texture.

STEP 10

FINAL RESULT

Self-Glaze Firing & Mechanical Polishing

The **self-glaze firing** differs fundamentally from a conventional glaze firing: no glaze material is applied. The restoration is heated to just below the softening temperature of the ceramic – the surface begins to flow on its own, creating an extremely natural, vital gloss that fully preserves the incorporated texture.



Fig. 16 & 17: Final result.

An applied glaze mass would partially level the fine perikymata and crack lines. The self-glaze firing instead preserves exactly that individuality so precisely incorporated during finishing. The final **mechanical polishing** completes the high gloss and accentuates the translucency of the tissue.



Fig. 18: Cervicogingival transition.



Fig. 19: Final result – close-up.

FINISHING STEPS:

- Self-glaze firing (no applied glaze mass)
- Mechanical polishing of ceramic surfaces

CONCLUSION

KATANA™ Zirconia YML and CERABIEN™ MiLai from Kuraray Noritake Dental Inc. open new dimensions in aesthetic dental technology. The combination of an intrinsically highly aesthetic multi-layer zirconia blank with CERABIEN™ MiLai, a veneering ceramic system designed for micro-layering on zirconia as well as lithium disilicate restorations, enables highly natural aesthetic outcomes with minimal material usage. The conscious omission of a liner firing, the targeted use of wash bake for optimal bonding, and the decision to make use of self-glaze firing instead of conventional glazing all express a thoughtful, material-oriented philosophy. The documented steps make clear that esthetic excellence is not the result of complexity. It is the result of precision, material understanding, and an unerring eye for detail.

The backlight photograph makes it strikingly visible: light flows through the restoration as through a natural tooth – proof of the harmonious interplay of KATANA™ Zirconia YML and CERABIEN™ MiLai.





About the author

Ghaith Alousi, born in 1994, successfully completed his training as a master dental technician in 2013 in Damascus, Syria, where he gained initial experience in a dental laboratory. From 2014 to 2016, he worked independently in Damascus, using his craftsmanship to produce ceramic work such as frameworks, veneers, crowns and bridges, and implant-based restorations. He also engaged in shade determination, photography, and CAD/CAM technology. He came to Germany in 2016 and quickly felt at home. Through further education, he has continuously expanded his knowledge and skills and is currently working as a dental technician in Wiesbaden. To achieve the best possible results, Ghaith Alousi places great value on collaboration with dentists and personal contact with patients.



管理医療機器 歯科の削加工用セラミックス
ノリタケ カタナTM ジルコニア

 **KATANATM Zirconia**

YML Yttria Multi Layered

□ A2 T14 Collar □

Incisal side
Occlusal side



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