



VITA VIONIC® DENT DISC multiColor

VITA VIONIC DENT DISC multiColor in Implantology: The Perfect Synergy of Titanium Framework and Composite Suprastructure

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The integration of proven analog dental materials into digital workflows combines the long-term clinical reliability of established materials with the precision, efficiency, and predictability of CAD/CAM technology. A prime example is VITA VIONIC DENT DISC multiColor (VITA Zahnfabrik, Bad Säckingen, Germany). The disc is manufactured from the same highly cross-linked VITA MRP (Microfiller Reinforced Polymer matrix) composite that has made VITA premium teeth a trusted solution in prosthetic dentistry for many years. Renowned for their excellent esthetics, durability, and wear resistance, these teeth have been successfully used in implant-retained dentures worldwide.

However, these had to be individually adapted to substructures, which was time consuming and resulted in uncontrollable layer thicknesses and an inhomogeneous bonding gap. The solution: a disc with an integrated shade gradient made of the same composite material. In the following user report, the dental technician Daniel Anselmi (Lab Anselmi, Villa María, Córdoba, Argentina) convincingly presents the new digital options for implant-supported solutions for full dentures, which are based on a proven material formulation.

Initial Situation vs. Final Result



The clinical case

A middle-aged patient presented in the dental office because he was dissatisfied with his previous full denture restoration. It did not provide the adhesion and the esthetics that he wanted. After thorough diagnostics and consultation, the decision was made for an all-on-X restoration with six implants in the upper jaw. After appropriate healing and osseointegration, the situation was to be manufactured with a combination of a sturdy titanium framework construction and a custom-fit suprastructure made of VITA VIONIC DENT DISC multiColor.

Details

After the clinical and tomographic examination, it was determined that the remaining teeth and the present implants had an unfavorable prognosis due to the extensive bone loss, chronic infections and an advanced impairment of the supporting tissue. Considering the patient's functional and esthetic expectations, an implant-supported full denture was planned according to an immediate loading protocol.

After the alveolar ridges were leveled and the implant beds were prepared, six implants were inserted, which produced sufficient primary stability for the application of an immediate loading protocol. The remaining bone defects were regenerated using particulate xenograft to optimize the peri-implant bone volume and the contour. After the operation, the implants were scanned and a fixed temporary denture made of PMMA VITA CAD-Temp monoColor was screwed onto the implants, which immediately restored the function, esthetic and soft tissue support.

Following the healing and osseointegration phase, and after analyzing the various materials available for prosthetic restoration, the decision was made to use an antagonist-friendly material in the form of a permanent, implant-supported FP3-type hybrid prosthesis featuring a titanium framework combined with VITA VIONIC DENT DISC multiColor.

Subsequent clinical and radiographic checks showed a favorable outcome with no signs of infection or biological complications, confirming sufficient implant stability and correct integration of the prosthetic restoration.

Esthetic and functional material mix

The titanium framework was intended to provide both reliable splinting of the implants and the necessary load-bearing capacity for the long-span rehabilitation. The suprastructure was planned to be fabricated from VITA VIONIC DENT DISC multiColor for a precise fit on the substructure. The teeth and base components were to be designed as a single, continuous unit to ensure maximum stability. As a result of the VITA MRP composite formulation, the VITA VIONIC DENT DISC multiColor makes it possible to compensate for chewing forces on the implants that are rigidly anchored in the bone, ensuring comfort and functionality. At the same time, the integrated shade gradient already offered a fundamental natural esthetic.

Virtual design

Even a premium material needs a high manufacturing quality with validated processes. After an intraoral scan, this clinical case was solved with perfectly coordinated digital process chains from three different software providers:

1. Conceptual Design (Exocad)

The overall architecture of the restoration was designed with the latest official version of DentalCAD 3.3 Chemnitz, including optimum emergence profiles and functional occlusion.

2. Segmentation (Blender for Dental)

The complex segmentation of the framework construction and suprastructure was implemented – a crucial step towards a precise fit and a stress-free bond.

3. Precision milling (MillBox)

The milling strategies were individually adapted to the two different materials. The result is a process that complies with the microscopic tolerances and ensures a passive fit as well as functional occlusion.

Finishing and integration

The CAD/CAM-supported manufacturing was done in the AIDITE AMM 520 PRO Milling Unit. The titanium framework was cut out of the disc, and the bases of the support structures were ground and polished. Directly after the subtractive manufacturing in the disc, the suprastructure showed an absolutely passive and precise fit according to the key-lock principle, without any manual modification. The suprastructure made of VITA VIONIC DENT DISC multiColor was also cut out of the disc and ground and polished on the bases of the support structures. After separation from the disc, the titanium structure was subjected to a strict, three-stage conditioning protocol. First, a precise mechanical polish was carried out on the basal surface. Then mechanical retentions were incorporated and the surface was sandblasted. Finally, a golden anodization took place.

This surface treatment not only maximizes the biocompatibility as well as the corrosion- and wear-resistance, but also fulfills an important visual function: The golden shade neutralizes the transference of the grayish metal substrate into the gingival area.

The inner surface of the suprastructure made of VITA VIONIC DENT DISC multiColor was conditioned through sandblasting with a pressure of 3 bar and the placement of mechanical retentions with a separating disc. As the final step, VITA VM LC PRIMER I and II was applied, achieving a predictable and high-strength connection between the two structures. In the following phase, the conditioning protocol of the suprastructure consisted of a selective mechanical polish in the coronal area with the diamond polishing paste VITA POLISH HYBRID. At the same time, the VITA VM LC PRIMER was applied in the mucogingival portions to maximize the interfacial bond strength between the VIONIC substrate and the VITA VM LC veneering composites, the G4 and G5 materials.

As the final step, the teeth were individually shaded to achieve a high degree of esthetic mimesis. The light-curing stain system VITA AKZENT LC was used for this purpose.

The shade mapping was strategically distributed: In the cervical third, the shades orange and russet were applied; gray and blue were applied at the incisal edges to reproduce the natural translucence effects; gray and white were used in the approximal areas to create visual depth.

Finally, glazing with VITA AKZENT LC GLAZE took place to visually and superficially seal the restoration.

Implant-prosthetic model of the future

This case demonstrates not only a rehabilitation, but also serves as a model for the future of implant-supported full-arch restorations. The result shows that a truly passive fit and bio-mimetic esthetic does not happen by accident – they are the result of strategic planning, precise design, validated CAD/CAM-supported manufacturing, proven bonding protocols and composite systems for an individual touch. This implant-prosthetic model of the future is more than the sum of its parts. Its value for laboratories, practices and patients not only lies in its material formulations and technologies, but in the profound understanding of its functional and esthetic interaction. The high-precision subtractive manufacturing leads to an absolutely precise, passive fit between the substructure and the suprastructure. This significant minimization of the fitting tensions in the implant-prosthetic system is what allows a predictable and long-term, clinically successful restoration. A perfect match in terms of technology and material that takes the all-on-X implant prosthetics to a new level.



Fig. 1: Initial situation: Insufficient esthetic and function.



Fig. 2: Initial situation with six implants in the upper jaw.

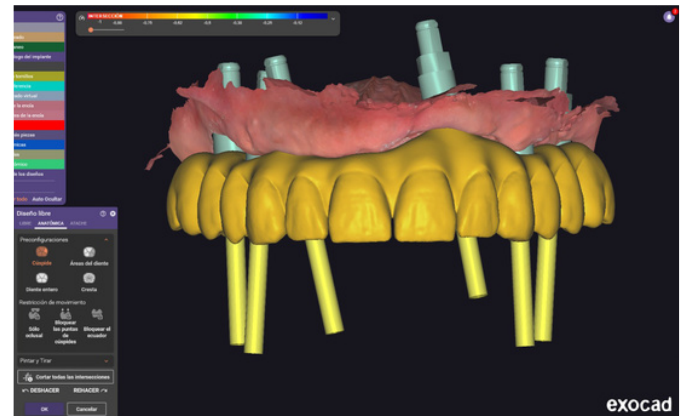


Fig. 3: The entire rehabilitation was designed in Exocad software.

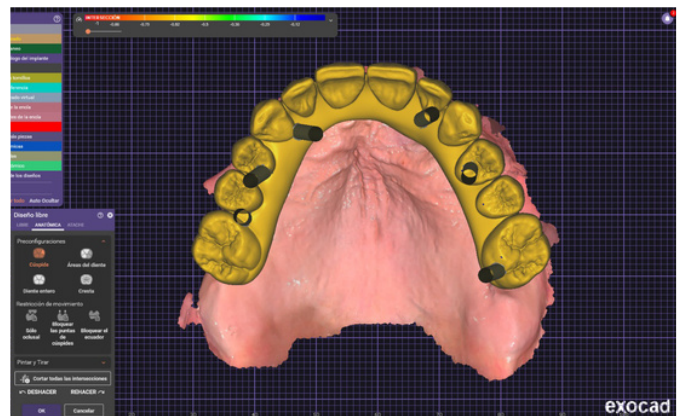


Fig. 4: The view of the screw channels in Exocad software.

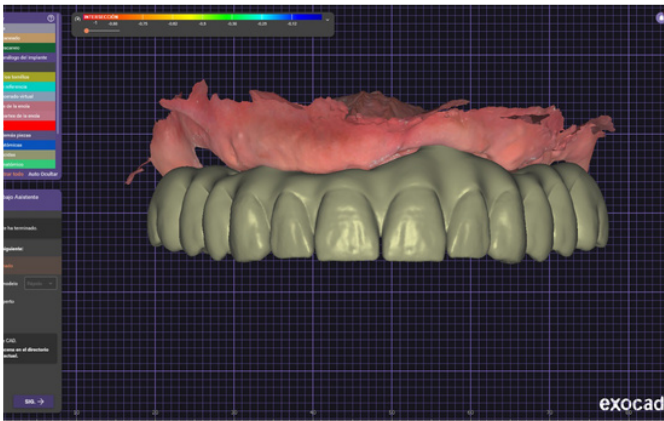


Fig. 5: The finished, overall design of the implant prosthetic.

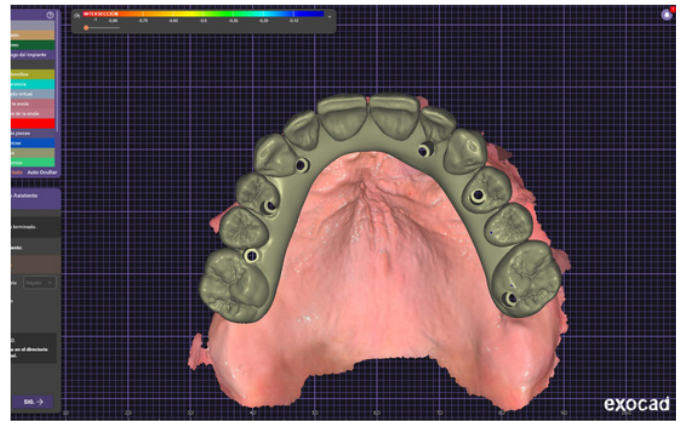


Fig. 6: Situation from the occlusal view before transfer to Blender for Dental software.

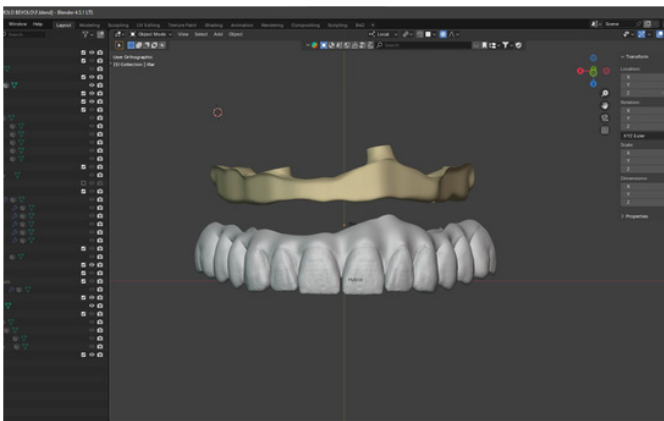


Fig. 7: The segmentation of the substructure and suprastructure in Blender for Denture software.



Fig. 8: Separation of the substructure and suprastructure in the basal view.

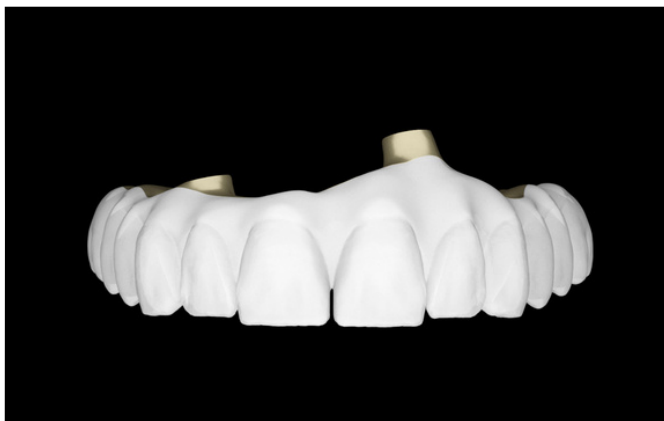


Fig. 9: The segmented design before transfer into the CAM software.

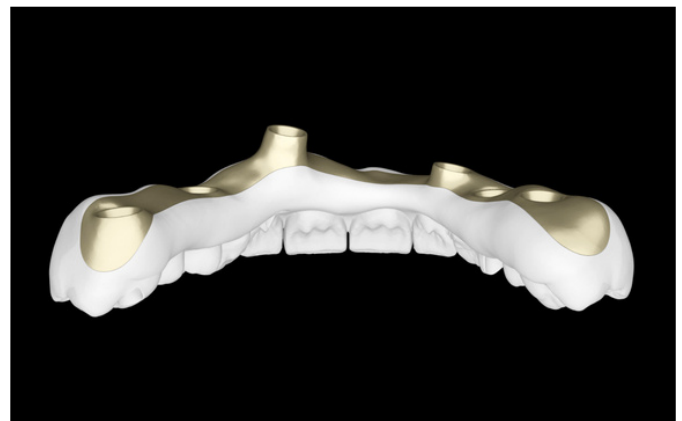


Fig. 10: Substructure and suprastructure in the view from basal in Blender for Denture software.

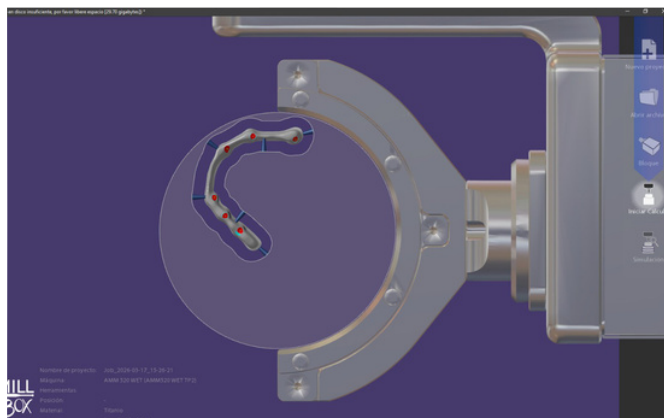


Fig. 11: The nesting of the substructure in MillBox CAM software.



Fig. 12: The nesting of the suprastructure in MillBox CAM software.



Fig. 13: The high-precision, subtractive result in VITA VIONIC DENT DISC multiColor.



Fig. 14: The milling result of the suprastructure in the basal view.



Fig. 15: Directly after manufacturing, the suprastructure showed an absolutely precise, passive fit with the substructure.



Fig. 16: The rehabilitation after the adhesive bonding of the substructure and suprastructure.



Fig. 17: Result after reproduction of the gingiva with veneering composite VITA VM LC and characterization of the teeth with VITA AKZENT LC.



Fig. 18: The implant-prosthetic model of the future in the lateral view.



Fig. 19: The composite stains VITA AKZENT LC provide an individual touch on the teeth.



Fig. 20: The precise bonding and fit of the finished rehabilitation in the basal view.



Fig. 21: The functional and esthetic result after integration.

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