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Protecting the Investment A Digital Workflow for Nightguards on Full-Arch Zirconia

Introduction

s full-arch zirconia restorations become the preferred solution for edentulous and partially edentulous patients, dental labs are increasingly responsible not only for delivering esthetic, functional prosthetics but also for helping protect those high-value restorations long term.

In this article, we share how Marrano Dental Arts uses their digital workflow for producing protective nightguards using Zirlux[®] Nightguards & Splint Resin - Flex, printed on the Asiga Max with the UltraGLOSS[™] tray. Unlike traditional nightguard fabrication methods, this workflow showcases a modeless process obtained directly from the final full-arch zirconia design, eliminating the need for additional scans or stone models.

The result is a durable, clear, and patient-friendly nightguard that fits seamlessly into the delivery of full-arch cases, providing both value to the lab's offerings and protection for the patient's investment.

Case Overview

This case involved a digitally fabricated full-arch zirconia hybrid restoration for a maxillary arch. Rather than using traditional impressions or scanning the final zirconia prosthesis post-milling, the lab leveraged the existing CAD design of the hybrid to produce a nightguard without any additional clinical or lab steps. The goal is twofold:

- 1. Provide the doctor and patient with a protective appliance to safeguard the new restoration.
- 2. Incorporate the nightguard as a value-added service delivered with the final case, increasing revenue and lab value without increasing chair time.

Value-Added Services Without Extra Workflow

Marrano Dental Arts executed the design modeless, leveraging the final hybrid zirconia CAD file as the reference arch. This eliminated the need for a second scan or printed model, significantly streamlining production.

Key Benefits:

- For the lab: Added a high-margin product with no added clinical steps or chair time.
- For the patient: Protected their high-cost zirconia investment from wear, fractures, or parafunctional stress.
- For the doctor: Increased confidence in long-term case success and enhanced perceived value of treatment.



Digital Design and Print Preparation (Figs. 1-2)

Using the hybrid design file, the lab designed a maxillary nightguard with:

- Uniform 2.0mm thickness over occlusal contacts
- Light guidance ramps
- Slight posterior relief to ease occlusal load

The STL was imported into Asiga Composer, oriented with the intaglio facing upward. STL is angled enough to reduce the supports on the occlusal side. Supports are minimal by using auto supports, and strategically added or removed to preserve key areas.

Figure 3

Nightguard in Asiga nested





Figure 4

Zirlux Resins and Asiga Max are available through Zahn Dental.



Printing

The nightguard was printed on an Asiga Max UV 385nm printer using the UltraGLOSS[™] tray, which reduced manual polishing (**Figs. 3-5**).

Printer settings:

- Layer thickness: 100 μm
- Validated exposure settings for Zirlux[®] Nightguards & Splint Resin
- Build time: ~105 minutes

Post-Processing and Curing

After an IPA ultrasonic rinse and static bath, the appliance was dried and supports removed. Post-curing was completed in the Otoflash G171 with 4,000 flashes under nitrogen (2 x 2,000 cycles) for full polymerization and a tack-free surface.

Polishing

Using the UltraGLOSS[™] tray reduced manual polishing. A scotch-brite was used in the areas where supports were removed and printed layer lines. A final polish was done with the KeyPolish finishing kit. The result: A clear, durable appliance.



Figure 5 Nightguard in Asiga

Adjusting the Fit

The Zirlux[®] Nightguards & Sprint Resin has softening behavior when warmed. This allows for adaptive fitting either on the model or intraorally.

In this case (Figs. 6-8):

- The printed appliance was placed in warm water (~60°C) for 15 seconds, softening the material just enough for a passive, custom fit over the final zirconia restoration.
- Once seated and cooled, the material retained its adapted shape with excellent retention.

This technique can also be used chairside by the clinician, especially when minor adjustments in retention or seating are needed. It was not needed on this case but may be necessary due to zirconia milling, shading/glaze thickness, or patient-specific anatomy.



Figure 7 Zirlux Nightguard on Zirconia Hybrid



Figure 8 Zirlux Nightguard on Zirconia Hybrid



Figure 6 Zirlux Nightguard Asiga

Conclusion

Incorporating the flexible Zirlux[®] 3D printed nightguards into your full-arch cases isn't just good for patient outcomes—it's good for business. The modeless workflow adds minimal production time but provides significant value to the lab, the doctor, and the patient.

Key takeaways:

- Use existing CAD data to create protective appliances with no added scan or model.
- Combining the flexible Zirlux[®] Nightguards & Splint Resin with Asiga's UltraGLOSS[™] tray is a win-win for digital workflows.
- Deliver a complete restorative solution that includes both the restoration and long-term protection. **JDT**

About the Author

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Zirlux is exclusively available through Zahn Dental.

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