

# labline™

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## EXCLUSIVE INTERVIEW

**Naoki Aiba**

„Nature is the best teacher”

## KURARAY NORITAKE

**Achieve mastery of all-ceramics  
with Noritake Porcelains**

SEAN PARK MDC DTG

## LABLINE ACADEMY

**Different restorative materials  
for different indications in the  
CAD/CAM workflow**

DR. MED. DENT. ALEXANDROS MANOLAKIS

MDT DIAMANTIS TSIFOUTAKOS

MDT GIORGOS NIKOLAOU

MDT KOSTAS NALBANTIS

  
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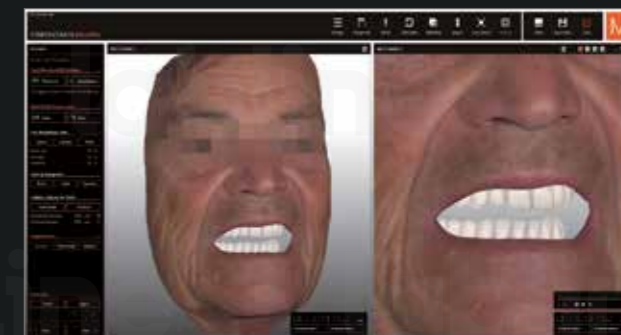
Case example made with the Zirkonzahn.Modifier software: complete Prettau® 2 restoration on anodised titanium bars, made by DT Federico Presicci at Zirkonzahn Education Center Brunico, Italy

## NATURE, OUR PARAGON FOR TECHNOLOGY

### ZIRKONZAHN.MODIFIER: THE NEW SOFTWARE FOR NATURAL-LOOKING, AESTHETIC RESTORATIONS

*An important aspect when creating full restorations is the tooth set-up. It helps to decide on the best possible solution as well as on aesthetic and function. Until now, the digital options here were limited. However, with the newly developed Zirkonzahn.Modifier software, the spectrum of design possibilities has widely broadened.*

*Zirkonzahn.Modifier has been conceived as an extension of the Zirkonzahn.Modellier standard design software. In particular, the software has been developed to expand the dental technician's possibilities during the restoration design, with a special focus on aesthetic. In the following pages, Wilfried Tratter, DT and software developer at Zirkonzahn (Gais, Italy), explains the company's aims related to the software development and describes the innovative concepts that Zirkonzahn.Modifier makes available to dental laboratories.*



*The human being is an aesthetic creature. Giving the patient his or her natural smile means creating that unique, individual and perfect harmony of forms that is at the origin of beauty.*





## INTERVIEW WITH WILFRIED TRATTER, DT & SOFTWARE DEVELOPER AT ZIRKONZAHN

*Zirkonzahn.Software, with all its programmes and modules, follows a practical and result-oriented principle, which guarantees the greatest possible freedom of choice and processing: the user interface is clearly structured, it has a simple design and all programmes relate to their corresponding modules and hardware components to ensure a 100% smooth work process. Zirkonzahn's newest software – Zirkonzahn.Modifier – is no different. Conceived as an add-on tool to the Zirkonzahn.Modellier design software, it brings dental laboratories' possibilities to a new frontier, meeting the dental technicians' design ambitions in terms of tooth set-up and aesthetic.*

*Given the existence of the Zirkonzahn.Modellier software, what drove the development of the new Zirkonzahn.Modifier?*

*Wilfried Tratter: Zirkonzahn.Modifier was developed in response to our – and our customers' – needs to set up teeth in a more innovative way and perform articulation in a more functional manner. As the tooth set-up is the most important aspect of every restoration, being the key factor to decide on aesthetic and function, many approaches used up to now did not satisfy us at*

*Zirkonzahn. For example, set-ups have always been created by placing teeth one by one. Since the opposing teeth are completely different, if the tooth shape has to be changed or teeth have to be added or removed, the whole work starts all over again, making the set-up process long and repetitive. Again, if I think of the adaptation of digital occlusal surfaces, I can say that up to date no satisfactory best-fit options exist. The current standard approach is to take tooth forms from the digital library and adapt them manually based on static or dynamic movements on the virtual articulator.*



*Fig. 1: Zirkonzahn.Modifier is perfectly integrated into Zirkonzahn's workflow and reflects the same interface of the complete Zirkonzahn.Software.*



When working with full restorations, this process can get really complex and time-consuming. Our aim was then to improve and optimise the dental technicians' job in terms of design options and analysis, bringing forth relevant functions that were still missing in the state of the art. This is how the conception of the Zirkonzahn.Modifier started. I must say, though, that this software is not to be considered as a replacement of our standard design software – Zirkonzahn.Modellier – but as an additional tool to enhance the aesthetic appearance of the restoration.

### Which are the most innovative features of Zirkonzahn.Modifier?

**Wilfried Tratter:** When developing our new software, we have taken nature as paragon and this is reflected in all software features. In nature, upper and lower jaws always interact with each other causing teeth abrasions according to individual chewing patterns. This effect pattern is the basic principle in our software. We have digitally coupled the teeth of the upper jaw with the teeth of the lower jaw in occlusion and the tooth pairs from the upper and lower jaws behave as a unit when it comes to occlusion. The great thing is that it does not matter whether I change something in the upper or lower jaw, since the effects on the antagonist are always carried out automatically by a special function called Smart Collision Handling. We can have naturally eroded teeth, so to speak, and various tooth set-up options and occlusion types are stored in the software for this purpose.



Fig. 2: Upper and lower jaws before (left) and after (right) the motion simulation.

Another interesting new tool for extensive individual adjustments to the teeth is the multi-view management. 2D and 3D pictures can be combined with front and side views as well as top views as desired, allowing the user to view the planned restoration at the same time from all sides as well as on the virtual patient. The software comprises four different preset multi-views that the user can select.

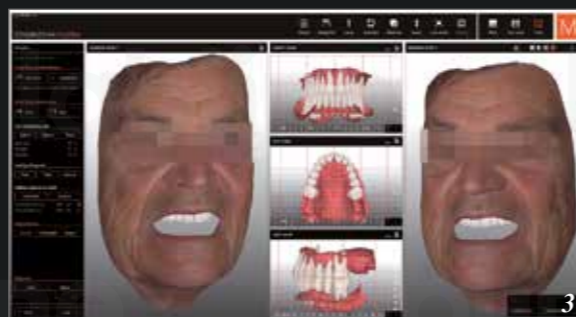


Fig. 3: Example of one of the four preset multi-views available in the software. The multi-view function allows the user to view the restoration in different positions as well as on the virtual patient.

The concept of reproducing movements in the virtual articulator has also been completely rethought, always according to the laws of nature. In reality, people do not only move their jaws in the directions that can so far be reproduced by standard virtual articulators. There is much more than forward, backward, right and left movements i.e. protrusion, retrusion etc. With our new articulator concept, the user can perform all jaw movements according to nature or simulate recorded jaw movement data acquired for example by means of the Plane Analyser.



Fig. 4: The new articulator permits to perform all natural jaw movements and reproduce different occlusion concepts, such as that of sequential movements according to Slavicek.

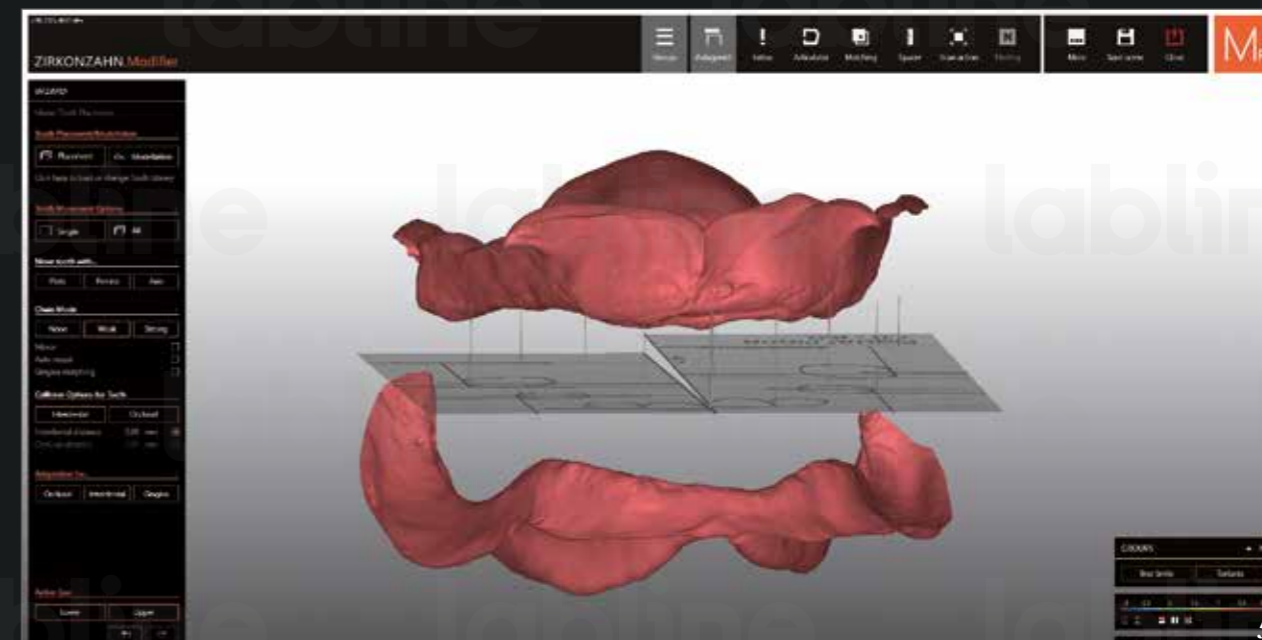


Fig. 5: The model scans are imported into Zirkonzahn.Modifier and aligned according to the patient's individual reference planes recorded during the analysis with the PlaneSystem®.

In addition, our virtual articulator permits to reproduce and consider different occlusion concepts, such as that of sequential movements according to Slavicek. The articulator also includes a measurement tool to analyse motion and angles. All of this makes our virtual articulator a step ahead of current physical articulators.

### How has Zirkonzahn's digital workflow taken a step forward thanks to the new software?

**Wilfried Tratter:** Let me spend a few words about Zirkonzahn's digital workflow before getting to the point. Our workflow works in perfect combination with the PlaneSystem®, a data transfer method that we developed in collaboration with our long-time colleague Udo Plaster. The PlaneSystem® is based on the simple acquisition of the patient's individual reference planes, which can subsequently be transferred into the software 1:1 with no loss of important information. Along with the PlaneSystem®, another important cornerstone of our workflow is the Face Hunter, our own-developed facial scanner for taking 3D pictures of the patient's face. In our Zirkonzahn.Software, such data can be matched to each other and to all other data available (like model or intraoral scans).

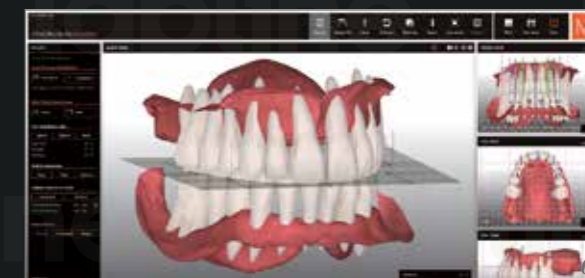


Fig. 6: For a fast design of full arches, a first aesthetic and functional set-up can be designed with the help of the rooted tooth library already articulated included in the software.



Fig. 7: Zirkonzahn.Modifier identifies the tooth contact relationships automatically. If something is changed in the upper or lower jaw, the effects on the antagonist are always carried out automatically by the software.



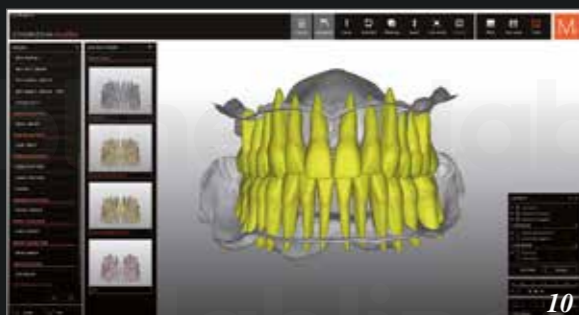


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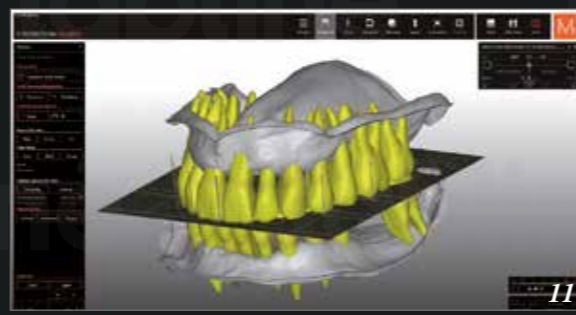
Figs. 8, 9: Example of face animation using 3D static face scans (the coloured lines are used to mark the lips in the software in order to simulate the animation and can be hidden).



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Fig. 10: Selection of different libraries already provided with preset occlusions.

In this way, the user can obtain a realistic 3D virtual reproduction of the patient's physiognomy and oral situation. This means that the treatment team can work "on the patient" without any space-time limits – as if the patient was ever-present – providing him with highly precise and individual restorations. Other than enhancing the restoration's functional and aesthetic aspects, Zirkonzahn.Modifier plays a decisive role in terms of innovative applications of face scans. Starting



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Fig. 11: The user can change the tooth colours individually. The teeth can be moved together in occlusion by moving the planes.



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Fig. 12: Digital Smile Design in 3D: face scans, data obtained with the PlaneSystem® and the planned restoration can be combined to have a complete virtual reproduction of the patient's physiognomy and oral situation. 3D animations allow the treatment team to simulate mouth movements and work "on the patient" without space-time limits – as if the real patient was ever-present.

from static face scans, for example, the user is able to generate 3D face animations. In plain language, this means that it is possible to show which movements the patient's lips makes during closing and opening. Also, we have developed the face scan morphing: face scans can be coupled with the planned restoration, so the user can immediately see how the lip moves when moving the front teeth. You see, also here nature was our source of inspiration!

## COMPLETE PRETTAU® 2 RESTORATION ON ANODISED TITANIUM BARS

Zirkonzahn's workflow including the Zirkonzahn.Modifier software

For the present case, an initial tooth set-up was created at the Steger Dental Laboratory (Brunico, Italy) using the above-mentioned design concepts included in the Zirkonzahn.Modifier software. All patient data available (3D facial scans, DICOM data, Natural Head Position, etc.) were then matched to the set-up and the treating dentist could plan the implants positions as accurately as possible in the dedicated software. Before the implants placement, the dentist was provided with the surgical guide, the model and the immediate restoration simultaneously. After the final healing phase, the patient's oral situation was captured again and all necessary changes were made in the Zirkonzahn.Modellier software. A temporary restoration was then created: this is a crucial step of our workflow, which permits the treatment team as well as the patient to test fit, look, comfort and function of the planned restoration before any permanent one, reducing at the same time the need for additional procedures and adjustments in the subsequent working steps. The patient



Example of surgical guide creation using the software Zirkonzahn.Implant-Planner.

wore the temporary restoration for several months, at the end of which the final prostheses and the titanium bars were milled using the M2 Dual Wet Heavy Metal milling unit, which permits the sequential processing of any material thanks to the two separate milling chambers.



With the new M2 Dual Wet Heavy Metal milling unit, provided with two separate milling chambers, it is possible to mill any material sequentially without in-between cleaning.





For the material, Prettau® zirconia was chosen, due to the material's perfect combination of high flexural strength and translucency. Such characteristics make Prettau® 2 suitable for the creation of monolithic full arches avoiding ceramic chipping and the abrasion of the antagonist. In this case, the restoration was manually coloured with specific colouring liquids and stains. The gingival area

only was veneered after the sintering process. Before the bars were bonded into the zirconia bridges, a golden-coloured anodisation of the titanium was carried out using the Titanium Spectral-Colouring Anodizer, in order to create a particularly aesthetic solution – indeed, the golden shade reduces the grey value and masks the bars under the zirconia structures.



The two Prettau® Bridges completed with the anodised titanium bars.

Case made by DT Federico Presicci at Zirkonzahn Education Center Brunico, Italy



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