

Digital Press Design



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Fig. 1 — Temporary in Telio Cad A3 (milled temporary)

The 26-year-old patient presented to our attention with acute gingivitis involving his upper incisors and canines caused by plaque accumulation around crowns with unsatisfactory marginal closures.

After the patient underwent oral hygiene therapy, it was suggested that the 6 crowns be remade even if they had

been recently made. The work had to be completed quickly as the patient worked abroad and his time availability was very limited.

After reshaping the crown abutments, we moved on to the provisional so that the patient could get an idea of the shape and the position of the finished work (Fig. 1). Once the impressions had



Fig. 2 — By making this type of model you can see the margins of closure perfectly as well as the gingiva; obviously we need a perfect impression (Geller model)

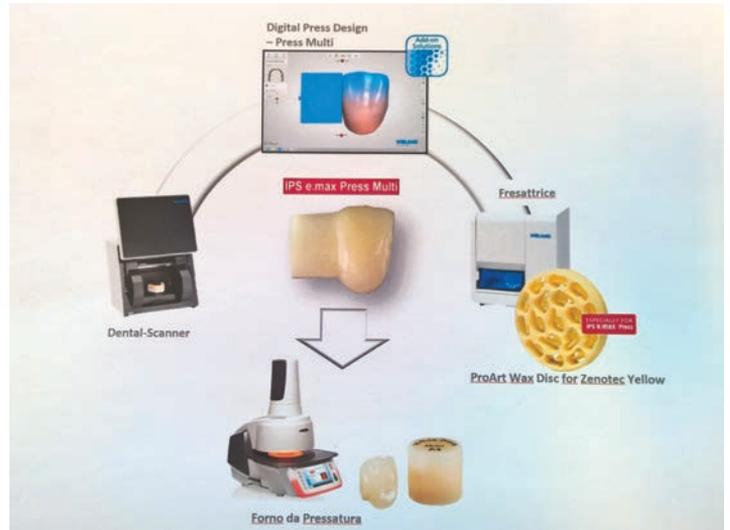


Fig. 3 — Digital Press Design Technique



Fig. 4 — My 3Shape D2000 scanner

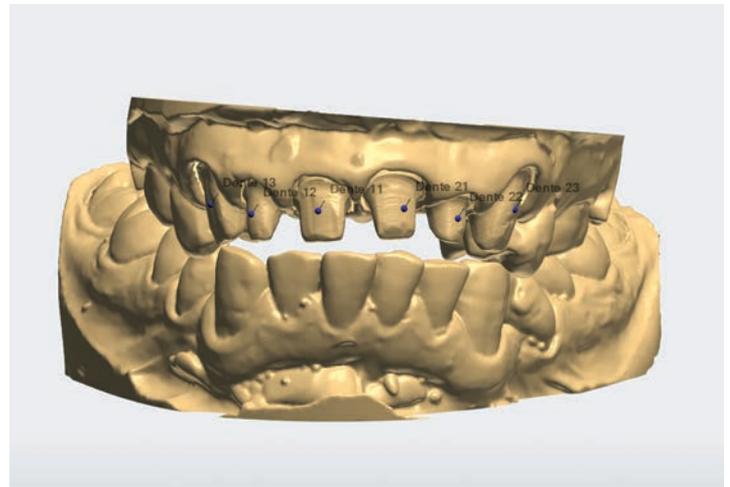


Fig. 5 — End of scan, choice of insertion axis and coronal closure margin of coronal closure

been received and the models made (Fig. 2), we moved on to the scanning. For this case we chose to apply the Digital Press Design technique (Fig. 3).

Digital Press Design is a unique innovation of Ivoclar Vivadent, an important solution with an efficient workflow for increased productivity. We use the automatic positioning for IPS e.max Press Multi available for 3Shape Dental System 2015. To implement this method requires a 3Shape scanner with dedicated software - Add-on Digital Press Design - Press Multi, in the fabrication of IPS e.max® restorations which combines the advantages of CAD/CAM technology with the efficiency of press technology. The add-on software is exclusive to Wieland and

its use is possible since the update of the Standard Dental Designer 2015 software (from Version 15.5.0) of 3Shape (Fig. 4).

Scanning the master model with removable stumps (Geller technique) and with the antagonist in occlusion, the marginal borders and axes of the single crowns were detected for insertion of the single crowns (Fig. 5). The software offers us a wide range of anatomical shapes of which we choose the most appropriate for the case (Fig. 6).

Once the digital modeling is finished, we continue to the finalization (Fig. 7). After having designed all the crowns, the system proposes the ideal pivoting according to the parameters

required by the IPS e.max Press Multi system (Figs. 8 to 10).

In the immediate we see the management of the enamel/dentin color transition, which we can further modify. The software proposes the correct positioning inside the pressing cylinder with a control template that simulates the real Sprue Guide, visible both from the front view and from the top view in a circular sense inside the cylinder (Figs. 11 to 13).

Another possibility offered by the software is with the model inside the cylinder (Fig. 14). Once the modeling has been completed and the crowns have been checked, the STL file is created and imported into the CAM,

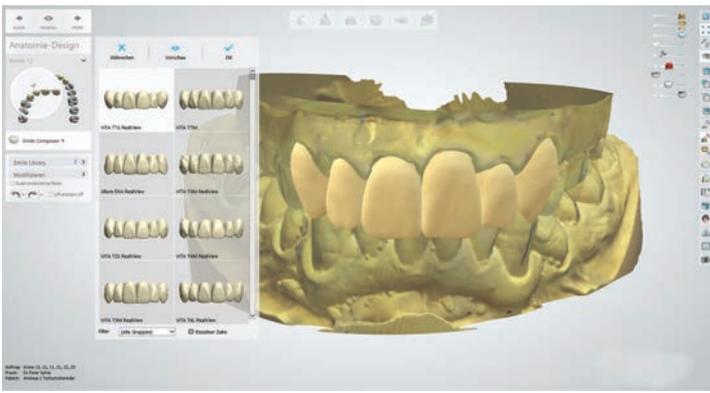


Fig. 6 — 3Shape offers a wide selection of tooth shapes



Fig. 7 — Finalization of digital design

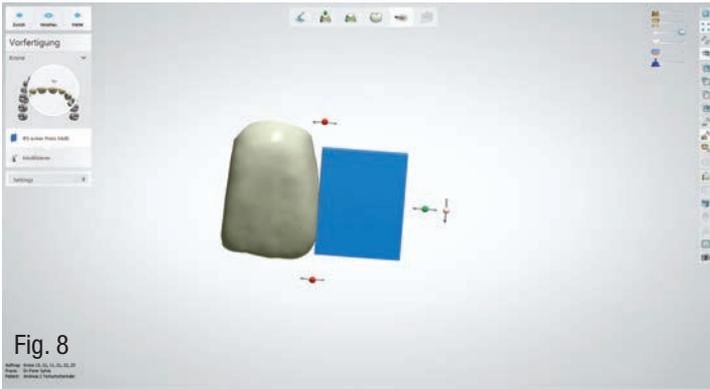


Fig. 8

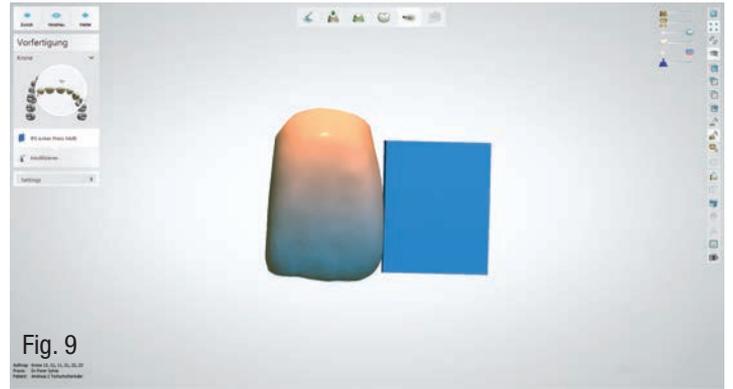


Fig. 9



Fig. 10

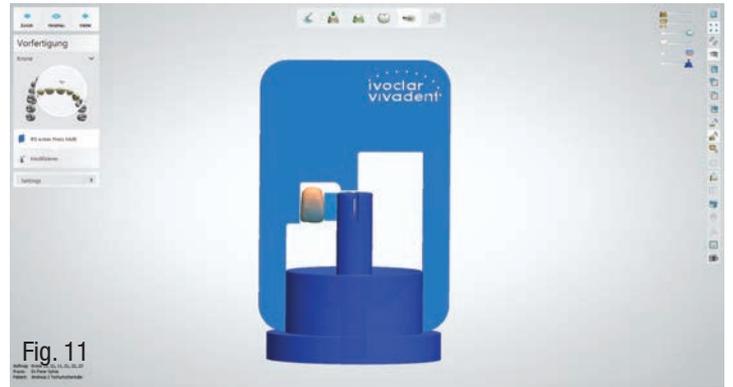


Fig. 11

Figs. 8 to 10 — Digital impressions with view of the dentin and enamel

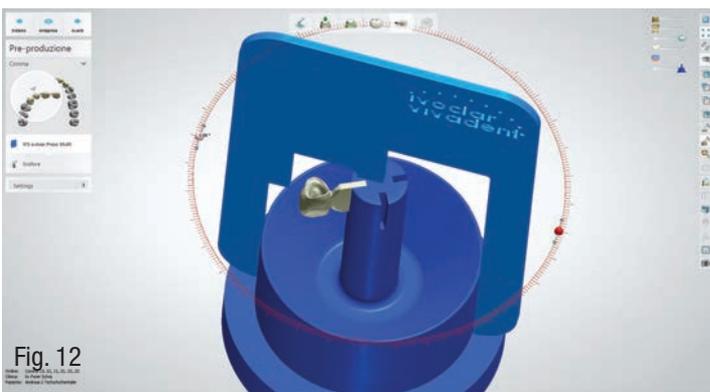


Fig. 12

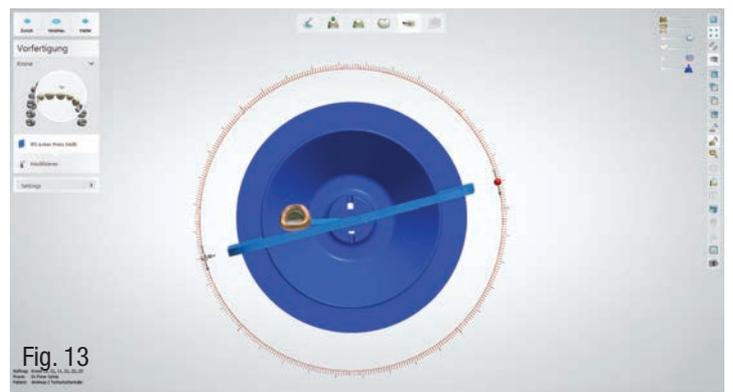


Fig. 13

Figs. 11 to 13 — Digital view of the position of the artifact inside of the Sprue Guide

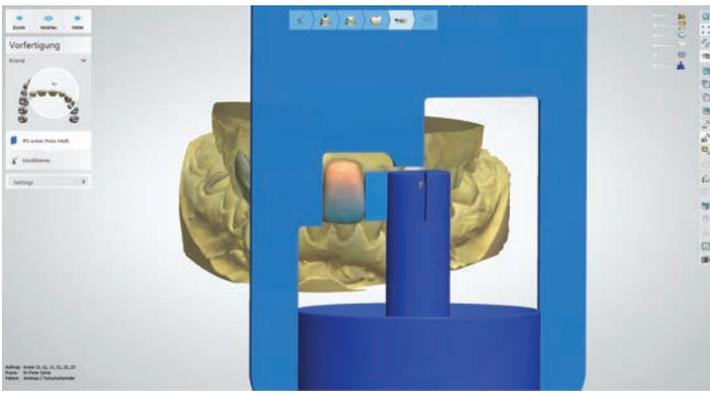


Fig. 14 — Possibility of seeing the position of the crown inside of the cylinder with the model

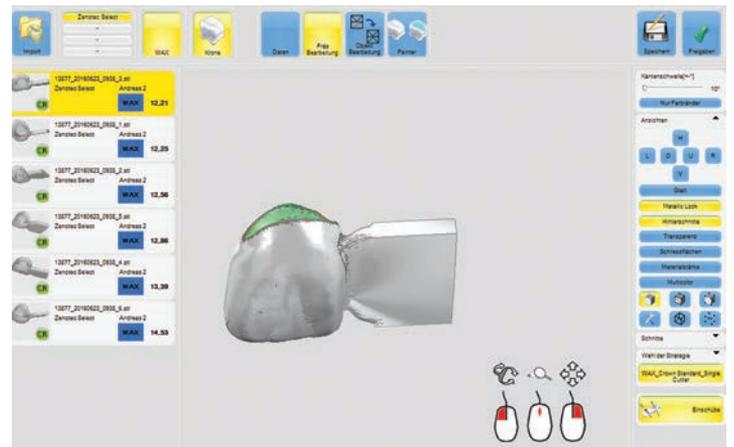


Fig. 15 — Selection of the milling strategy

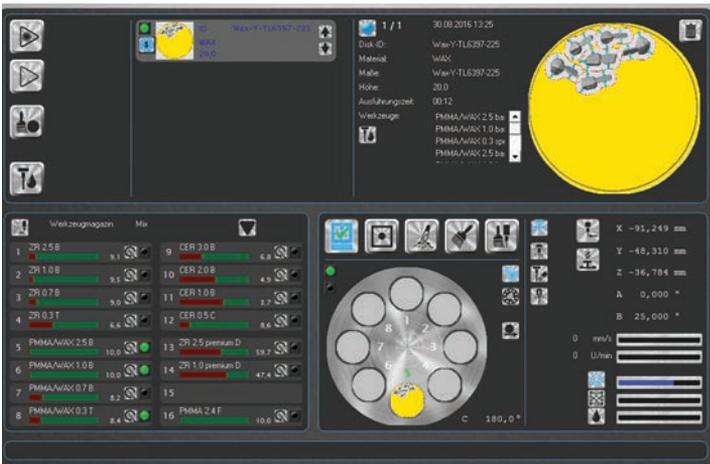


Fig. 16 — CNC control panel



Fig. 17 — Fresatrice Zenotec Select Hybrid Milling

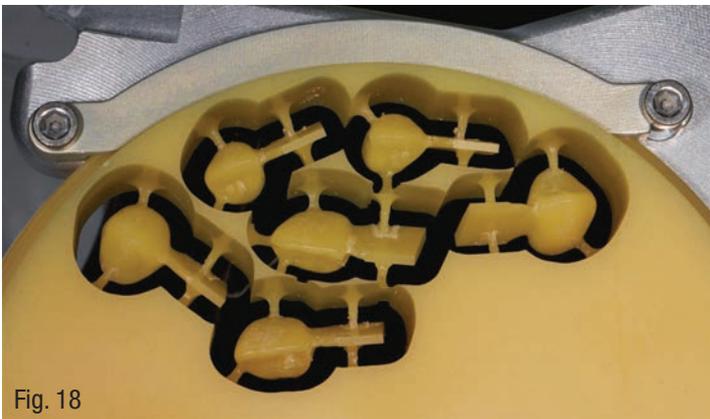


Fig. 18



Fig. 19

Figs. 18 & 19 — The milled objects are truly "a spectacle".

the milling strategy is chosen as well as the nesting within the appropriate wax disc (Fig. 15).

After the CAM software has calculated the milling strategy (header strategy milling strategy (tested strategy

provided to us by Ivoclar Vivadent) we import our file into the CNC control panel (Fig. 16).

The yellow Pro Art Wax Disc from Zenotec Yellow is inserted which possesses characteristics of stability and

high milling quality and is ideal for the pressing technique. (Figs. 17 and 18). Once the milling has been completed, the edge closure is checked (Figs. 18 and 19). You can see that we have achieved a precise and excellent result (Fig. 20). For restorations placed on the cylinder

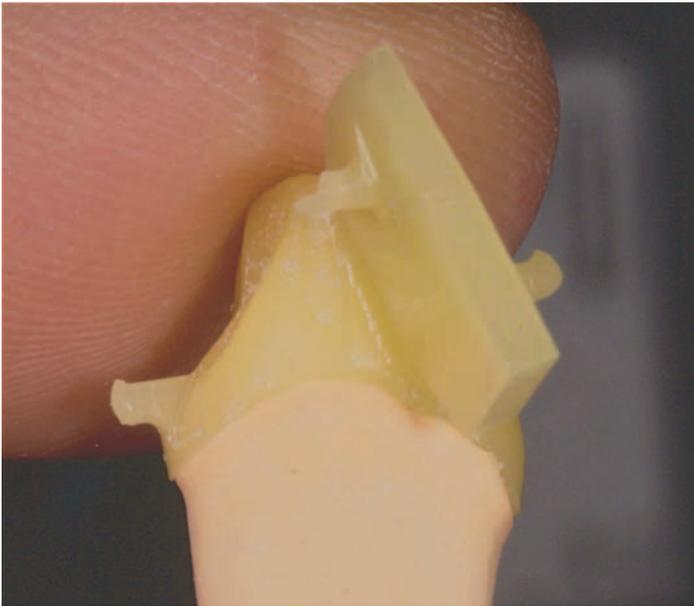


Fig. 20 — Impressive precision. The image shows how the wax crowns fit on the die after being removed from the wax-up without retouching.

base, thanks to the Sprue Guide control, we can see that the position is the same as the digital one (Figs. 21 and 22).

The method involves the use of the practical IPS e.max Press Multi Basic Kit equipped with all the accessories including cylinders, blanks, etc. for investing and pressing. (Fig. 23).

After removing the investment ring from the preheating furnace, it is placed in the press furnace EP 5010, and

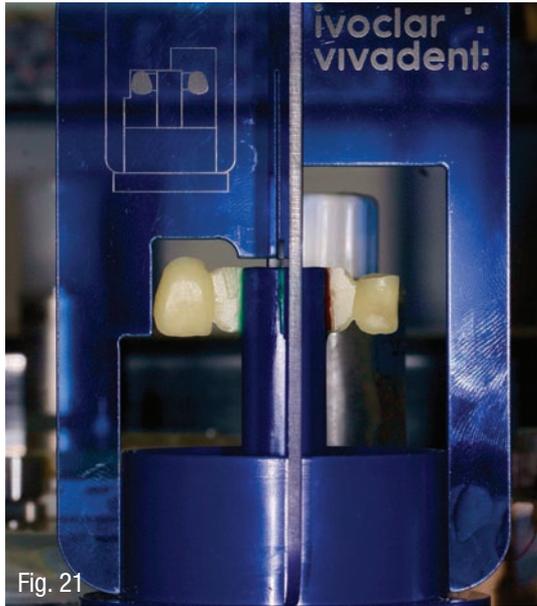


Fig. 21

Figs. 21 & 22 — Position perfect on the cylinder base that perfectly mirrors the digital one

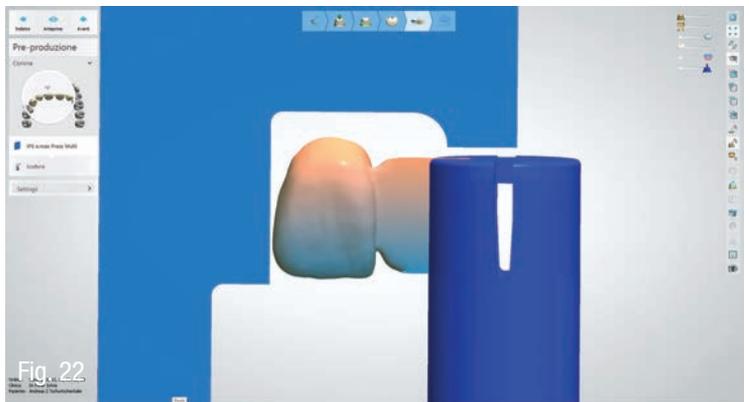


Fig. 22



Fig. 23 — IPS e.max Press Multi Intro Kit

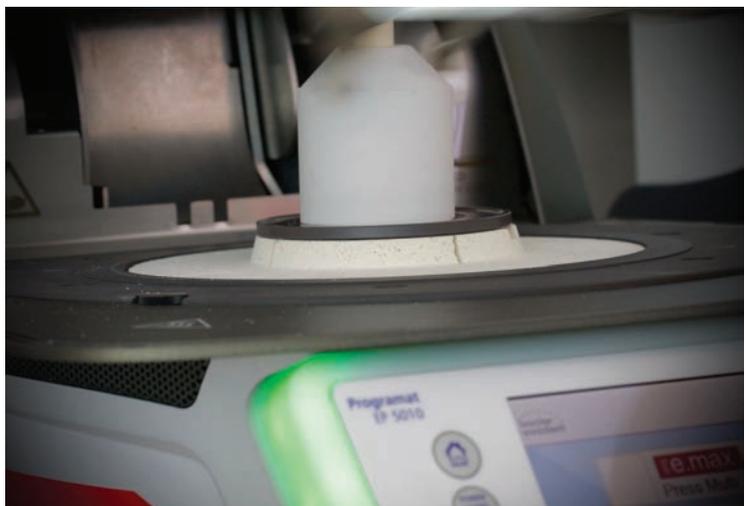


Fig. 24 — Positioning of the cylinder in the pressing furnace EP 5010

the IPS e.max Press Multi ingot is inserted (Fig. 24). After pressing, the parameters with the press values, time, path and temperature of the investment ring are displayed on the furnace screen. (Fig. 25). After cooling, the product is demoulded.

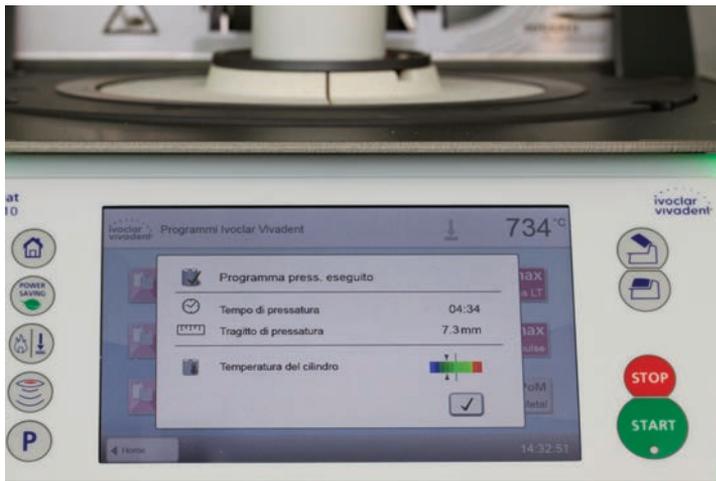


Fig. 25 — End of pressing well controlled by the excellent EP 5010



Fig. 26 — Excellent color transition of dentin and enamel as seen in the digital design



Fig. 27



Fig. 28

Figs. 27 & 28 — The crowns fit perfectly on the model and are finished in a short time



Fig. 29

improved by painting the areas of the middle third of the cervical area and the posterior region with IPS Ivocolor. The restoration is completed with the new IPS Ivocolor stains (Figs 29 to 32). The restorations are adhesively cemented.

The restorations are cemented, and the result is particularly aesthetic and garnered full patient satisfaction.

Apologies for the lack of final intra-oral photo but the patient had to return to work abroad and cancelled the appointment for the final photos.

In this type of work, we have perfectly married the digital and analogue methods and yielded particular advantages such as efficient execution time, excellent workflow, excellent precision and more than satisfactory aesthetics for the patient. 

You can see the surface is clean thanks to the high quality of the wax. The gradual and natural transition of dentin and enamel is immediately apparent (Fig. 26).

Once the plates have been cut and the contact points have been finished, we check that the restorations fit on the

model and perfectly reflect the shape obtained digitally (Figs 27 and 28).

We move on to the fabrication of the surface texture and the characterization of the restorations after checking the functional movements (lateral and proximal). It is important at this point that the esthetic appearance should be



Fig. 30



Fig. 31

Figs. 29 to 31 — Crown after finalization



Fig. 32 — IPS Ivocolor Shade and Essence stains universal

Acknowledgements

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About the Author

Stefan Strigl was born in Bruneck in 1976 and graduated from the "Galileo Galilei" vocational school

in Bolzano in 1994 and completed his training at the Dental-Bruneck laboratory in Bruneck. Since 2002 he has been the owner of the laboratory in Bruneck. He attends master courses with national and international lecturers. From 2013 to 2015 he was a member of the Seattle Study Club at Tegernsee in Germany and President of APA in the field of dental technicians since

2014. He has been using CAD-CAM technology for over 11 years and became a Straumann collaborator in 2014 where he began to take his first steps as a lecturer. He has been collaborating with Ivoclar Vivadent as a speaker since 2014.