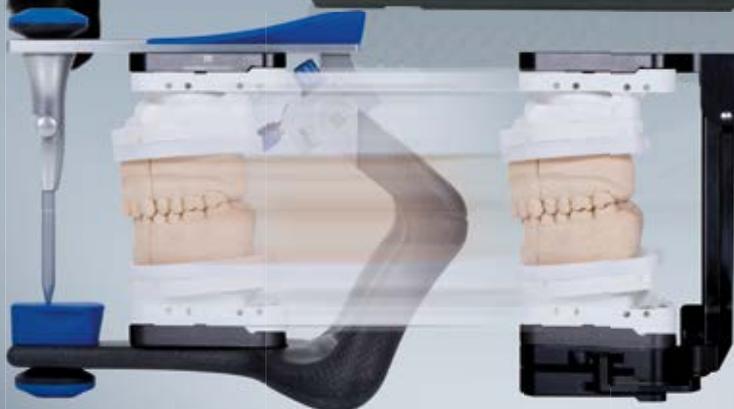


Digital, but without  
loss of function



AMANNGIRRBACH

DFP - Digital Functional Prosthetics

# DFP - Digital Functional Prosthetics by Amann Girrbach

## DFP - Quo Vadis

“Digital Functional Prosthetics” describes the end product in the Ceramill fabrication chain - the functional, interference-free prosthetic restoration fabricated digitally in the laboratory.

Even in the CAD/CAM era it is essential to work analogous to the patient. The Ceramill Artex® - the virtual Artex® CR articulator - enables occlusal surfaces to be designed highly precisely also on a digital basis. At last, the daily problem of having to grind in occlusal surfaces encountered by dental practices can be reduced considerably also for CAD/CAM prosthetic restorations.

## DFP - No-loss digitalisation

To make use of the functionality of the virtual articulator, it is essential to transfer the model situation from the “actual articulator” 1:1 to the scanner. The Ceramill System provides for this with the Ceramill Fixator - a combination of transfer jig and model holder, based on the Splitex®, used for holding the model in the scanner. The Ceramill Fixator enables the model to be transferred to the scanner while retaining the axis relationship of the “real articulator”. The Ceramill Fixator is specially calibrated for the Ceramill Map400 Scanner with Splitex® holder to ensure maximum precision when digitalising the model situation.

## DFP - “The precision chain”

When using the Ceramill System, the entire laboratory working process becomes a “precision chain” as a functionally non-interfering prosthetic restoration can only be fabricated if precision procedures are implemented right from the very beginning and pursued throughout the entire process. The “precision chain” starts with the Giroform® precision model - the following indicates the necessary steps for carrying out the working procedure from A to Z without compromising on precision. AmmanGirrbach supply the entire range of matched equipment and material. A method easily learned by every laboratory completes the circle and it has become easier than ever before to fabricate frameworks from A to Z using “functional precision”.



## Why DFP?

### Benefits for the dental laboratory

- \_ Cost-saving due to avoiding guarantee claims and courtesy services
- \_ Avoids fractures and chipping of ceramic due to optimally planned space for the veneer
- \_ Easily learned by every dental technician
- \_ Operators are thrilled
- \_ Adapts easily to the type of design preferred by the operator

### Benefits for operators

- \_ Massive reduction in time needed for grinding-in
- \_ Brief treatment times as less reworking required
- \_ Satisfied patients
- \_ Aesthetics and functional parameters retained
- \_ Aesthetically functional top results for the patient

### Benefits for patients

- \_ Avoids repairs and unnecessary treatment to combat pain
- \_ Aesthetics and functional parameters retained
- \_ Aesthetically functional top results for the patient
- \_ Avoids temporomandibular joint problems and dysfunctions
- \_ Avoids remakes

# DFP - anatomically correct model transfer

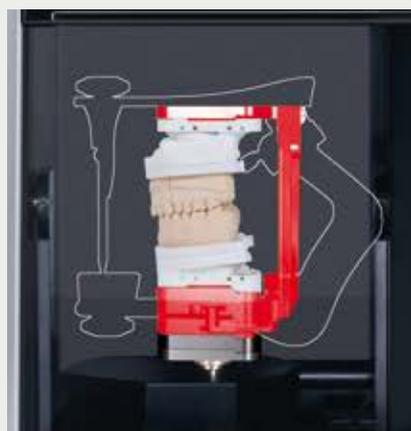


1:1 transfer of the model situation from the “real articulator” into the scanner is absolutely essential to utilise the functionality of the virtual articulator. The Ceramill system enables correct transfer using the Ceramill Transfer kit - a combination of transfer stand (Ceramill Fixator) and model holder on a Splitex® base, which is used for holding the scan model in the scanner.

The Ceramill Fixator enables transfer of the model in the scanner while retaining the axis relation of the “real articulator”. As the Ceramill Fixator is specially dimensioned for the Ceramill Map400 scanner with integrated Splitex® holder, it guarantees maximum precision when digitising the model situation.



Articulated models in the Ceramill Fixator and Artex® CR. The models were synchronised using the Splitex® key.



Ceramill Fixator with articulated model in the Ceramill Map400 (Symbol illustration of the Ceramill Fixator).



Ceramill Map400 with model in the Ceramill Fixator - for lossless transfer of the model situation.



# DFP - The method

## Preoperative condition/indication:

6 unit PMMA anterior bridge

In this case particular attention is to be paid to custom incisal guidance as well as the resulting design strategy with guidance facets built up specifically on the restoration. This anatomical framework design allows adequate space for veneering later. This is a preventive measure against possible interfering stresses which considerably reduces the risk of chipping even on older restorations.

## Objective:

Functionally non-interfering framework with integral "protective function" for the residual dentition.

## ceramill artex®



The virtual articulator from Amann Girrbach - an uncompromising 1:1 conversion of the most successful fully-adjustable articulator in the world, the Artex® CR. Now new and including custom, virtual incisal guidance.

It's the technical as well as visual full functionality of the Ceramill Artex® which makes digital occlusal design involving "functional-

ly-conscious" dental technology possible. All the excursions and functions of the Ceramill Artex® can be animated on the monitor. Error-free digitalisation of the model as well as visual reproducibility of the occlusal design enable **digital functional prosthetics** to be achieved quickly, conveniently and reliably.

## Would you like to know more about DFP?

Form your own opinion at one of the info events in your area. Our CAD/CAM service team will be glad to provide you with all the information.

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Setting up the incisal guidance using diagnostic models to represent the preoperative status for fabricating the anterior restoration.



Shows an Artex® CR with prepared master model and after setting the incisal guidance table.



After matching, the tooth contours are customised using the freeforming tool.



Those areas required for framework-supported incisal guidance are freeformed specifically.



Once again, the contact areas on the modelled teeth are shown.



Any interferences or contact areas identified on the pattern during dynamic adaptation to the opposing dentition are reduced automatically.



3

The articulated models are transferred to the Ceramill Fixator with no loss in precision.

The Ceramill Fixator is then placed in the Ceramill Map400 Scanner on a Splitex® precision base.



4

Shows the results after scanning the articulated pair of models.



5

The scan of the diagnostic model.



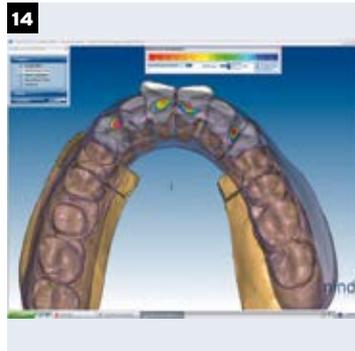
6

Determining the preparation margins.



13

The differences between the diagnostic model and customised teeth are evaluated.



14

The thickness and location of those tooth regions which lead to contact areas are recognisable.



15

Opening of the virtual articulator with the custom incisal guidance unit.



16

Setting the patient-specific inclination of condylar guidance.



23

The resulting guidance facets are readily identifiable.



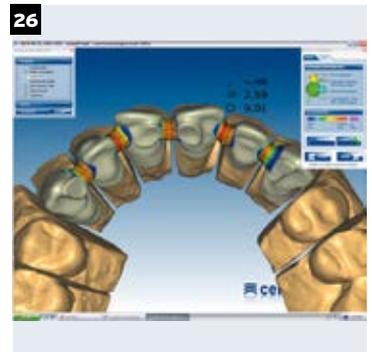
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Those areas of the teeth are marked which are to be retained as guidance facets.



25

The framework is automatically reduced by the thickness required for building up the veneer. The selected guidance facets are retained.



26

The connectors for splinting the crowns are custom-designed for the case, taking into account the minimum diameter required for the specific material.



Aligning the diagnostic model with the working model.



The design software (Ceramill Mind) automatically positions the diagnostic model on the residual dentition optimally.



Designing the teeth.



The teeth are matched to the diagnostic scan fully automatically.



The settings are programmed by graphic animation in real-time on the Ceramill Artex®. Like this, they also correspond optically to those of an actual articulator.



The simulated excursions are carried out using the programmed articulator parameters such as sagittal inclination of condylar guidance, Bennett angle, immediate sideshift and the custom incisal guidance table.



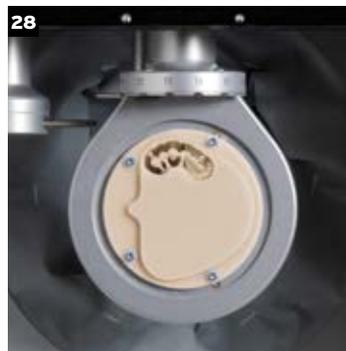
Left and right laterotrusive excursions as well as protrusive and retrusive excursions are carried out.



The excursions are carried out taking into account the values programmed into the custom incisal guidance table.



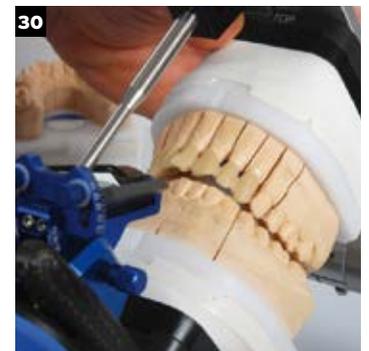
Shows the data record of the finished bridge framework.



The PMMA blank with the frameworks milled in the Ceramill Motion 2.



Shows the bridge framework on the actual model. The guidance facets are easily recognisable.



The guided excursions follow the virtually designed guidance facets on the bridge framework precisely. This ensures that the residual dentition is protected optimally.

# DFP - the precision chain in dental technology

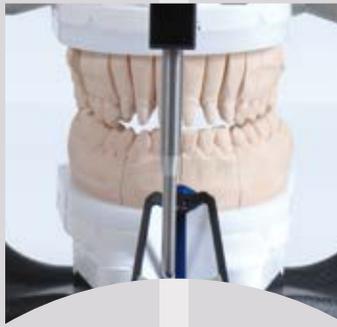
DFP (Digital Functional Prosthetics) is an optimised working process for easily and efficiently producing functional, interference-free restorations digitally in every laboratory. This aim requires constant precision in all important working stages - from model fabrication to a CNC-manufactured "functional framework".

## MATERIAL

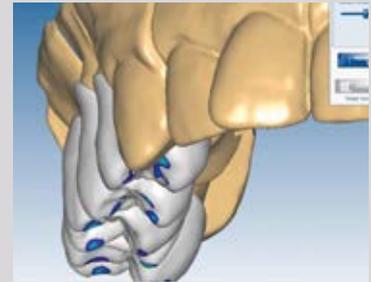


### Optimal for fully anatomical restorations:

Ceramill Zolid  
Ceramill Zi  
VITABLOCS for Ceramill Motion 2  
Ceramill Temp

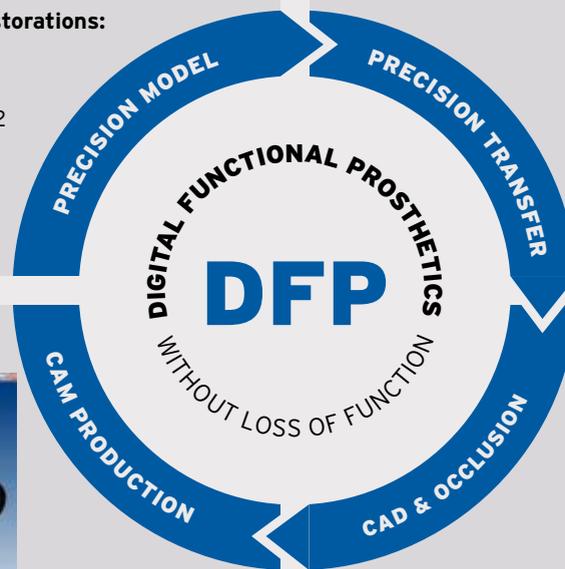


## METHOD



### DFP "Digital Functional Prosthetics"

Design strategy and method for fabricating functional, interference-free restorations using the Ceramill CAD/CAM system.



## FUNCTION



### ceramill artex®

Dynamic occlusal contouring using the Ceramill Artex® to avoid occlusal interference - especially suited for monolithic restorations.



- \_ Fabricate fully anatomical zircon oxide restorations highly efficiently in your own laboratory
- \_ Non-veneered, no risk of chipping and easy to fabricate
- \_ Avoid grinding in with dynamic occlusal contouring

© Uwe Klingner, Klingner Zahntechnik

## TEMPLATE



### ceramill mindforms

Library teeth designed by Knut Miller - high-quality, aesthetically functional basis and also "accelerator" for the design of fully anatomical crowns and frameworks in zircon oxide.



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